

# Entomologist's Gazette

COMMONWEALTH INST.

April, 1956 - entomology library

Vol. 7, No. 2

24 APR 1956

EDDA

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April, 1956.

Vol. 7, No. 2

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*ENTOMOLOGIST'S GAZETTE* is published Quarterly in January, April, July and October. The Subscription Rate is one pound per year.  
For Advertising rates apply to The Editor.

## NEWS AND VIEWS

In our last issue (*Vol. 7, No. 1, Jan. 1956*) an unfortunate transposition took place in the captions to the figures illustrating the paper on Trichoptera, by Mr. D. E. Kimmins. This transposition took place after the final proofs had been checked. Our Printers, Kenion Press Ltd., ask us to convey their apologies to readers; they have supplied an amended copy of pages 35 and 36, and this is being sent out with this number.

Mr. N. D. Riley, C.B.E., retired from his position of Keeper of the Department of Entomology at the British Museum (Nat. Hist.) in November, 1955, and the Trustees of the Museum have appointed Dr. W. E. China to the position. We should like to offer our best wishes to Mr. Riley for a long and happy retirement—which we feel quite sure will be a very active one, and to Dr. China for a happy term as Keeper—he will have the backing of a loyal and able staff.

For the fine coloured plate in this issue we have to thank two members of our Editorial Panel, Dr. E. A. Cockayne, O.B.E., F.R.E.S., and Mr. H. B. Williams, Q.C., LL.D., F.R.E.S., who have very generously defrayed the not inconsiderable costs of production.

A considerable number of letters has been received concerning a possible increase in the cost of the *Gazette* next year. Almost every

letter expresses the opinion that it would be better to raise the subscription than to cut the number of pages. One subscriber, who has supported us since our first number, suggested that we should raise the subscription to 30s. and increase the number of pages. After careful consideration of the rises in printing costs and of postage, we have decided to fix the subscription for next year at 26s. We are reluctant to do this, but readers will realize that, in spite of continually rising costs, there has been no increase in the subscription rate since we first commenced publication in 1950. One or two correspondents express disappointment that we appear to be giving less space to Lepidoptera. Two others suggested that we could well cut the Lepidoptera contributions severely now that we were getting so much good material on Other Orders!

The facts are that in Vol. 6 (1955), of 244 text pages (excluding the index), 109 were on Lepidoptera. This takes no account of *News and Views* and *Book Reviews*, which may be presumed to be of general interest. This appears to be a reasonable balance and we shall try to maintain it.

We have in hand a considerable number of long and medium-length papers awaiting publication, but few of them are on Lepidoptera. We want good papers and short and medium-length notes on Lepidoptera—it is up to readers to supply them.

One other comment from a reader's letter seems worth passing on—"that subscribers should recommend the *Gazette* to their local Libraries for display in reading and reference rooms".

The occasion of the 94th birthday of Dr. Karl Jordan on 7th December, 1955, called for congratulations from entomologists all over the world. Although belated, we assure Dr. Jordan that our good wishes are as sincere as any. The Royal Entomological Society of London have issued a '*Karl Jordan*' volume in the form of a collection of essays and scientific papers from the pens of many authors (*Trans. R. ent. Soc. London*. Vol. 107. 1955).

Miriam Rothschild contributes a Biographical Sketch which is wholly delightful, and, although the contents of this volume are all of a very high standard, this delightful sketch is at once one of the lightest and most human contributions of its kind that we have ever had the pleasure of reading.

At Five Pounds this volume will be beyond the reach of a good many entomologists who are not Fellows of the Royal Entomological Society, but so many of the papers are of importance and permanent value, and others of such great interest and readability, that we do urge those who can, to at least borrow a copy in order to see how ably our premier British Society can handle such a job. We feel sure that Dr. Jordan must feel delighted at such a tribute.

THE VARIATION OF *CRYPHIA MURALIS*  
 Forst. 1771,  
 AND AN IRISH SUBSPECIES

By E. A. COCKAYNE, D.M., F.R.C.P.,  
 and

HAROLD B. WILLIAMS, Q.C., LL.D.

Illustrated by a coloured plate.

In *The British Noctuae and their Varieties*, Vol. I (1891), p. 9, Tutt discusses the variation of this species. He gives Forster's original description (*Novae Species Insectorum*, p. 74, No. 74) and expresses the opinion that the bright green form, with white edging to the black transverse lines, etc., is the type, the lines and shades being arranged as in the figure in Newman's *British Moths*, p. 244.

Donovan (*Cat. Macrolep. Ireland*, p. 31) dissents from the view that Forster's type is necessarily bright green, translating *virens* and *virescens* as meaning greenish or any shade of green and not necessarily bright green. We find ourselves in agreement with Donovan, there being no justification for the interpolation of 'bright' in the translated description.

Tutt refers to a number of aberrations—

1. ab. *par* Hb. 1809-13, *Sammlung Eur. Schmett.* Pl. 110, fig. 516. Tutt describes this from Hübner's figure as follows: 'Anterior wings dull ochreous grey with the base brownish, then a pale band with a greyish patch around the orbicular; the reniform outlined in grey; two dark grey transverse bands outside reniform; several short black costal streaks. Hindwings ochreous grey with two transverse dark shades.'

There are five examples agreeing with Hübner's figure in the Rothschild-Cockayne-Kettlewell collection at Tring, and we find Tutt's description generally satisfactory.

2. ab. *viridis* Tutt 1888, *Entom.* xxi 48; Cf. Tutt, *Brit. Noct.* 1891, p. 10. Tutt says that this, like *par*, has the black markings very indistinct, but there is in addition a total absence of the grey colour which gives *par* its mealy appearance. The whole of the fore wings is of a very rich green colour.

This is satisfactorily described as a greenish *par*. It is, however, quite impossible to segregate a long series into sharply defined colour forms.

3. ab. *flavescens* Tutt 1888, *Entom.* xxi 48; Cf. Tutt, *Brit. Noct.* 1891, p. 10. Tutt says this is like the type but with the ground colour of a yellow shade instead of green. He adds that he thought these

were faded until he bred specimens from Deal. H.B.W. remembers taking freshly emerged specimens at Deal in 1908. Tutt, in *Brit. Noct.* (1891) p. 10, described the ground colour as 'yellowish'.

4. ab. *pallida* Tutt 1888, *Entom.* xxi 48; Cf. Tutt, *Brit. Noct.* 1891, p. 10. Tutt says 'marked like the type, but the ground colour of a pale whitish grey'. This is sufficiently described. It may be more frequent in Deal and Folkestone, whence Tutt's examples came, than elsewhere, but we have seen Deal series which do not contain it. There are examples in the Rothschild-Cockayne-Kettlewell collection from Ventnor, Paignton and Torquay.

5. ab. *obscura* Tutt 1888, *Entom.* xxi 48; Cf. Tutt, *Brit. Noct.* 1891, p. 10. Tutt says 'the ground colour of a dull brownish grey, markings obscure, as in var. *par*, and a little darker than the ground colour. It is the darkest and most obscure form of the species I have seen'. Tutt evidently had not seen *brunnea*. He adds (1891) that *obscura* has no trace of green. The type of the variety was captured by Mr. Austin at Folkestone, and Tutt adds that he took one specimen of the same form at Sandwich in August, 1886. There is a series of *obscura* in the Rothschild-Cockayne-Kettlewell collection at Tring, the best examples being labelled 'Dawlish' and 'S. Devon'.

Tutt observes that Kane has informed him that all the above varieties occur at Queenstown, in Ireland.

Tutt also deals with *impar*, but we think it convenient to deal with other aberrations before referring to this form.

6. ab. *aurolichenea* Culot 1909, *Noctuelles* I. 132, Pl. 24, fig. 10. Culot describes this form as follows:

'Angleterre, coll. Oberthür. Le ton général du dessus des ailes supérieures est d'un jaune d'or légèrement ochracée, avec les dessins ordinaires bien marqués, de fines éclaircies blanches ressortant avec quelques traits noirs qui les soulignent. Les ailes intérieures\*, en dessus, sont noirâtres, plus foncées vers le bord marginal.'

This is a clearly defined form, and is well figured by Culot. In the Rothschild-Cockayne-Kettlewell coll. there are twenty examples, labelled 'Dawlish', 'S. Devon' and 'Torquay'. We think it probable that all the known examples are from Dawlish.

7. ab. *argillacea* Culot 1909, *Noctuelles* 133, Pl. 24, fig. 11 ♂. Culot describes this form as follows:

'Muséum de Genève.—C'est parmi les richesses que possède notre Musée d'Histoire naturelle que j'ai découvert cette curieuse aberration, où elle figurait avec un?—Elle est très remarquable par sa coloration rousse et j'ai cru bon de lui donner un nom pour la distinguer; j'ai choisi le nom de *Argillacea* qui caractérise bien sa coloration. J'ajoute que j'ai en mains un autre exemple ♀, appartenant également au Muséum de Genève. Cet exemplaire ♀, qui est étiqueté: *Genève*, est très voisin d'*Argillacea*. Ses ailes supérieures

\* *Sic.* This is no doubt a misprint for inférieures.

sont d'un roux terne, et les inférieures d'un brun roux plus foncé qu'aux supérieures. Cet exemplaire peut certainement être considérée comme la ♀ de *Argillacea* car la différence de coloration est trop légère pour établir une séparation.'

We have seen no example of this form. As regards its colour it may be intermediate between *aurolichenea* and *brunnea*, but the hind wing colour is very distinct.

8. ab *brunnea* Porritt 1923, *Ent. mo. Mag.* 59, 87. Porritt describes this as follows: 'Ground colour deep orange-brown, with the markings typical.' He says that these brown forms have only been found at Starcross, S. Devon, whence they were first brought to notice by the late J. Jaeger, who used to collect them freely from one old wall there. Since then H. J. Turner and the Rev. C. F. Bentall found them in plenty in the same locality. The shade and depth of brown colour varies considerably in different specimens but the name *brunnea* may include them all.

This is a most distinct form. There is a series in the Rothschild-Cockayne-Kettlewell coll., some of which are labelled 'S. Devon' and others 'Dawlish'. We do not doubt that these are from Starcross, which is close to Dawlish, and in fact between Dawlish and Dawlish Warren.

9. ab. *albida* Colthrup 1929, *Proc. S. Lond. Ent. & N.H. Soc.* 1927-28, p. 97. In a report of a meeting we read:

'Mr. Colthrup exhibited long and varied series of *Bryophila perla* and of *B. muralis* (*glandifera*) with some examples of the Cambridge race, *impar*. Among the *B. muralis* were two very white specimens ♂ and ♀, for which he proposed the varietal name of *albida*. The series was a selection from twenty years' collecting.'

Colthrup's series, in an aged storebox, was sold in a minor sale at Glendinning's some years ago, and was acquired by H.B.W., whose series is now incorporated in the Rothschild-Cockayne-Kettlewell coll. By this chance the ♂ holotype and ♀ allotype of *albida* are now at Tring, the ♂ holotype from Newport, I. of W., 13.viii.1902 and the ♀ allotype from Eastbourne, July, 1902. This form is very distinct from *pallida* Tutt, and the Rothschild-Cockayne-Kettlewell coll. contains a long series, including examples from Felpham, Sussex, 1908, H. Ashby; S. Devon, 1906, B. H. Crabtree and two from Torquay, August, 1925, Kerr, which closely resemble the holotype. The form is variable in markings, and the Rothschild-Cockayne-Kettlewell coll. contains a very well marked example labelled 'Great Britain' from the Rothschild coll. and one with extensive dark markings, Mullion, Cornwall, H. B. D. Kettlewell, 1936.

10. ab. *scoriatula* Turati 1919, *Natural. Sicil.* 1919 (Sep.) p. 64. This is described and figured by Turati. It is said to have the entire ground peppered with black scales, so that the olive tone of the ground colour is almost completely covered; the black transverse stripes are wide, stigmata like glowing coals therein.

## PLATE A

Fig. 1. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♂ holotype. Passage West, Co. Cork, Aug., 1933, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 2. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♂ paratype. Passage West, Co. Cork, Aug., 1933, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 3. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♀ allotype. Passage West, Co. Cork, Aug., 1933, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 4. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♀ paratype. Cork, Aug., 1927, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 5. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♀ paratype. Cork, July, 1935, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 6. *Cryphia muralis* ab. *castanea*, Cockayne & Williams, ♀ paratype. Cork, Aug., 1931, M. S. Dudley Westropp. Rothschild-Cockayne-Kettlewell Coll. Tring.

„ 7. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♀ paratype. Monkstown, Co. Cork, Aug., 1931, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 8. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♂ paratype. Cork, 2nd Aug., 1929, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 9. *Cryphia muralis* subsp. *westroppi*, Cockayne & Williams, ♂ paratype. Cork, Aug., 1926, M. S. Dudley Westropp. E. A. Cockayne Coll.\*

„ 10. *Cryphia muralis* ab. *similis*, Cockayne & Williams, ♀ allotype. Cork, 5th Aug., 1912, M. S. Dudley Westropp. E. A. Cockayne Coll.\*

„ 11. *Cryphia muralis* ab. *similis*, Cockayne & Williams, ♂ paratype. Cork, 1st Aug., 1908, M. S. Dudley Westropp. E. A. Cockayne Coll.\*

„ 12. *Cryphia muralis* ab. *similis*, Cockayne & Williams, ♂ paratype. Cork, 30th July, 1908, M. S. Dudley Westropp. E. A. Cockayne Coll.\*

„ 13. *Cryphia muralis* subsp. *impar*, Warren. Cambridge, Aug., 1906. E. A. Cockayne Coll.\*

„ 14. *Cryphia muralis* ab. *glaucia*, Cockayne & Williams. Cambridge, 1900, ex Farren Coll. E. A. Cockayne Coll.\*

„ 15. *Cryphia muralis* subsp. *impar*, Warren. Cambridge, 1922. H. B. D. Kettlewell Coll.\*

„ 16. *Cryphia muralis* subsp. *impar*, Warren. Cambridge, 1900, ex Farren Coll. E. A. Cockayne Coll.

„ 17. *Cryphia muralis* subsp. *westroppi*, ♀ paratype. Co. Cork, Aug., 1933, M. S. Dudley Westropp. H. B. Williams Coll.\*

„ 18. *Cryphia muralis* subsp. *westroppi*, ♀ paratype. Passage West, Co. Cork, Aug., 1933, M. S. Dudley Westropp. H. B. Williams Coll.\*

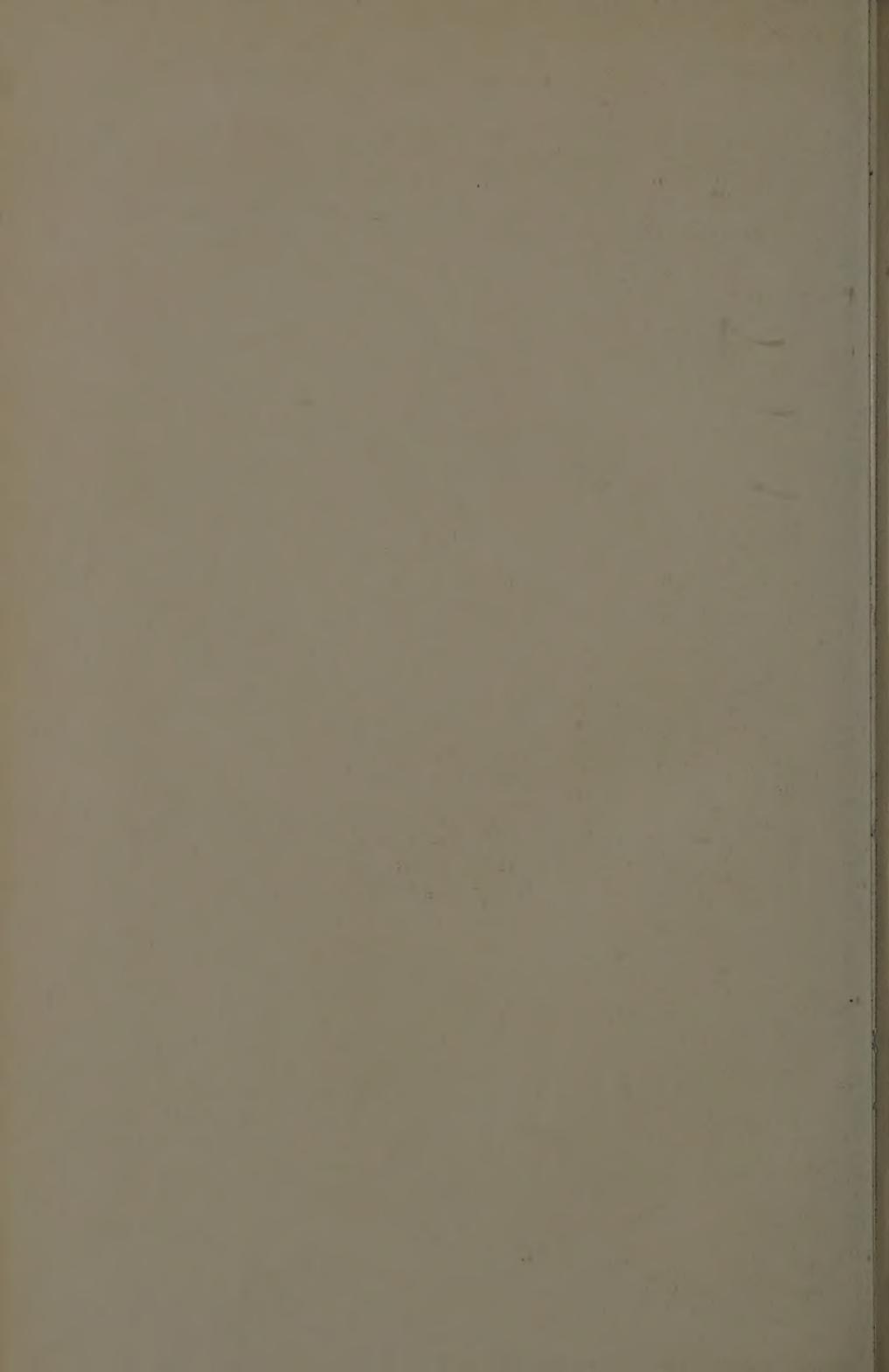
„ 19. *Cryphia muralis* ab. *castanea*, ♀ holotype. Cork, Aug., 1931, M. S. Dudley Westropp. M. S. Dudley Westropp Coll.\*

„ 20. *Cryphia perla* (Schiff.) ab. *albida* Colthrup. Eastbourne, Sussex, bred July, 1903, W. R. Bowden. H. B. Williams Coll.\*

„ 21. ab. *albida*. Eastbourne, bred July, 1903, W. R. Bowden. E. A. Cockayne Coll.\*

\* All these examples are now in the Rothschild-Cockayne-Kettlewell Coll., British Museum, Tring. Figs. 1-5, 7-21 del. Miss D. Fitchew. Fig. 6, del. H. B. Williams.





11. ab. *dispar* Verity 1904, *Bull. Soc. Ent. Ital.* 36, p. 74. This is described and figured by Verity. It is said to have green scales on the fore wings without yellowish or brownish tone; the black markings sparse or indicated by deeper green. The hind wings are paler than in other races. It is recorded from the Appenines in August.

12. subsp. *amasina* Draudt 1931, *Seitz. Macrolep. Suppl.* 19, Pl. 29. A small subspecies from Amasia, resembling *perla*.

13. ab. **griseo-flava** ab. n.

This has the markings and rather mealy appearance of *par* but the ground colour approaching that of *flavescens*, but of a dingier shade of orange-yellow, due, no doubt, to the presence of the *par* factor. The markings of *par*, as shown in Hübner's figure, are present even in the palest examples.

♂ holotype. Folkstone, July, 1909. T. G. Hills.

♀ allotype. Folkestone, July, 1909, T. G. Hills.

Paratypes ♂ S. Devon, E. A. Rogers. No date.

♂ 'Great Britain', Rothschild coll. A very fine and faintly marked example.

♂ Sandown, I. of W., 1891, L. B. Prout.

♀ Sandown, I. of W., 1892, L. B. Prout.

All the above are in the Rothschild-Cockayne-Kettlewell coll. at Tring, where there are also other examples from Bristol (1887), Hythe, Bude, Freshwater, I. of W., and Paignton. There is also an example labelled 'Cambridge, Warren 1883, Crowley Bequest', but we think this label is misplaced.

14. subsp. *impar* Warren 1909, *Seitz. Macrolep.* vi, 21. Cf. Warren, *Ent. mon. Mag.* xxi (1884) 22, 23.

We think we should quote the two passages cited above.

(1) *Ent. mon. Mag.* xxi, 22—*Bryophila impar*, n. sp. distinct from *B. glandifera*.—In consequence of the confusion which appears to be made between the mealy-looking variety of *B. glandifera*, which occurs along with the typical form on the coast, and which is sold by the dealers as Var. *Par*, and the *Bryophila* which we take at Cambridge it will be as well to give the latter, which already has a local habitation, a distinctive name as well. Mr. Stainton, who has seen my series of the Cambridge insect, and considers it certainly distinct from Hübner's var. *Par*, said, in his joking way, 'call it *impar*': and by this name I propose to distinguish it for the future. I should add that besides Cambridge, we must now include Cork as a locality. I have seen specimens, belonging to Mr. de V. Kane, which he informs me were caught in that neighbourhood.—W. WARREN, Merton College, Cambridge: May 15th, 1884.

This is evidently a *nomen nudum*, there being no description whatever, and no figure. The inclusion of the Cork examples, to which we shall refer later, under the name is therefore of no effect.

(2) *Seitz*, vi. 21—ab. *impar* Warr (4d)\* is green dusted with black or rufous; the lines more or less obsolete; the green colour fades more quickly than in typical *muralis*; this form occurs only at Cambridge, where the typical form is non-existent.

This form, described from Cambridge, is extremely well-known in spite of the unsatisfactory descriptions. We know of three figures, i.e., *Seitz* vi, Pl. 4f, a figure which does not resemble any form of *impar* known to us, *Barrett*, *Brit. Lep.* vi, Pl. 249, fig. 1c, which is better but not good, and *Culot*, *Noctuelles*, Pl. 24, fig. 9, which is a more satisfactory figure. We have thought it well to figure three examples (Pl. A, figs. 13, 15, 16).

Since the first published reference to it in 1880 (*infra*) the form has continued to occur, in fluctuating numbers, on old walls in Cambridge. It was first recorded by Warren in *Entom.* xiii (1880) 223 in an article entitled 'Addition of *Bryophila par* to the British fauna'. He reports taking a pair of a *Bryophila* at Cambridge 'more than twenty years ago' which he thought distinct from '*glandifera*' but Bond and Crotch considered them to be a 'variety' of that species. Zeller at first determined them as *par* but later agreed with Barrett that they were a distinct species. Warren then gives an elaborate diagnosis of the differences between the Cambridge form and '*glandifera*' but gives no name to the former, being content at that time, apparently, to call them *par*, thus creating the confusion upon which he animadverted four years later.

Warren finally reached the view that *impar* is confined to Cambridge. It is in our view not accurate to describe *impar* as 'green' as Warren does in *Seitz*. In the long series at Tring (nearly 200 examples) there are only two green ones, and these are of a pale blue-green, quite unlike the green of *muralis*. We do not believe that *impar* is green on emergence, each of us having seen it alive, and we do not think it is exceptionally liable to fade. It is variable, as will be seen from the Plate illustrating this article, but the lightest and darkest have all the characteristic markings and except for the difference in tone there is a general similarity, the females being usually, but not always, darker than the males. In the Rothschild-Cockayne-Kettlewell coll. there are seven examples of an ochreous tint which are remarkably similar to the Cork examples to be discussed later.

The occurrence of *impar* at Bedford has been reported (one example) but the evidence is unsatisfactory and needs confirmation.

In the Rothschild-Cockayne-Kettlewell coll. there are five examples from Gloucester, taken by Mr. Austin Richardson in 1951. These are much darker than Cambridge *impar*, but the lightest is very near to the darkest Cambridge examples. We understand that the Gloucester examples are not all dark and we think they must be regarded as *impar*.

\* This reference is erroneous. The figure is at Pl. 4f.

We think the blue-green form of *impar* merits a name and we therefore describe it as—

ab. **glauca** ab. n.

Resembles subsp. *impar*, but the ground colour is a pale blue-green, the dark markings of *impar* present but as in the lighter, and not as in the darker, examples of *impar*.

♀ holotype. Cambridge, Farren, 1900.

We figure this example, Pl. A, fig. 14.

♀ paratype. Cambridge, August, 1885, W. Warren. ex coll. Mason.

Both the above examples are in the Rothschild-Cockayne-Kettlewell coll. Two fine examples of this blue-green form are in the H. Worsley Wood coll. in the Haslemere Museum, taken by H. Worsley Wood at Cambridge 10.vii.1937 and 28.vii.1937. These are similar to the examples at Tring.

It has often been said that *muralis* is a coast insect in Britain. This statement is generally true. It occurs in most suitable localities on the South Coast, from Kent to Cornwall, in the Isles of Scilly, on the North Coast of Cornwall, Devon and Somerset. Barrett says (*Brit. Lep. VI*, 209-210) that it is rare in Suffolk and was once taken, by Lord Walsingham, in Norfolk. In Wales it is widely distributed on the coast, a very well-marked form is taken at Cardiff, and Barrett reports it in plenty from Swansea and on the coast of Carmarthenshire and Pembroke, and says that it is recorded from Pwllheli in North Wales.

We do not find its occurrence at Bristol, Cambridge, Gloucester, Bath, Wells, and at Winscombe in the Mendips where E.A.C. found larvae, or its former occurrence in South-east London, inconsistent with a coastal distribution, but there are other inland localities not consistent with such a distribution, e.g., Marlborough and Chippenham in Wiltshire, as reported by Barrett. It is not confined to coastal districts abroad and the Lichens on which the larva feeds are by no means confined to coastal areas here—indeed they support substantial populations of *C. perla* in many inland districts.

The species is also common on the south coast of Ireland, particularly in Cork City and in the Cork harbour area. This occurrence was, we think, first recorded by Kane, *Proc. Roy. Irish Academy*, 2nd Series IV (1884-8) in a 'Report on Irish Lepidoptera' at pp. 105 *et seq.* At p. 112 he says Queenstown is very productive and the first Irish locality recorded for *B. glandifera* v. *par*, which he says occurs there in greater abundance than at Cambridge and in company with the type. As he mentions Stainton's view that the Cambridge form is distinct from continental *par*, it is clear that Kane is discussing *impar* or a form closely resembling it.

Kane also discusses Irish *muralis* in *Cat. Lep. Ireland, Entom.* xxvii (1894) 209. He says that the type has been taken by the Rev. Joseph Greene and he thinks by the late Frederick Bond, and elsewhere in the County of Cork by Mr. Sinclair, whose collection was in

Kane's possession. He comments on their greater diversity and says that Bond had examples which he stated (*in litt.*) were greener than any English ones in his possession. He adds that in Galway a few examples of ordinary character had been captured by Mr. Allen and Mr. Dillon.

Donovan (*Cat. Macrolep. Ireland*, 1936, 31) says that very little is actually known of the distribution in Ireland of this moth. He says Co. Cork is at present the main habitat of the species, but adds that it has been recorded from Co. Galway; is common near Galway (Allen, *Entom.* 1894, p. 270) and Clonbrock (Dillon, *Entom.* 1894, p. 91). We attach no importance to Dillon's records, but regard Allen's note as reliable.

Donovan possessed ninety-two examples from Co. Cork, which he says he owed to the liberality of Mr. Dudley Westropp. Each of us possessed a comparable series, thanks to the generosity of the same distinguished Irish entomologist, who did not, to our grief, live to see the publication of this paper, and the three series are now united in the Rothschild-Cockayne-Kettlewell coll. at Tring. We consider this to be a valid subspecies, and we name it—

subsp. **westroppi** subsp. n.

Smaller than *muralis*, though variable in size. The smaller examples at Tring have a wing expanse of 22 mm., the majority of about 25 mm. and the two largest attain 30 and 32 mm.

32 mm. is a good average for English *muralis*. We have seen one or two larger ones, which must be considered to be exceptionally large and are no doubt rare. Smaller examples occur more frequently in England but an expanse of 25 mm. is certainly exceptionally small in English examples. Variable in colour and marking, the range of variation corresponding generally to that observed in English examples, though, as will appear later, forms occur which have not been recorded in England and some English forms, e.g., *brunnea*, have not appeared in Co. Cork. The green forms, corresponding to nominotypical *muralis* and *viridis*, are more intensely coloured, i.e., of a deeper green, than English ones.

We have seen a very beautiful example, taken by H. C. Huggins at Cork in 1952, of an intense green with the black markings very much reduced, except on the costa but with the white markings clear and distinct. It is in appearance intermediate between nominotypical *muralis* and *viridis*.

♂ holotype. Deep green with the usual black and white markings of *muralis*. Passage West, Co. Cork, August, 1933, Dudley Westropp. Pl. A, fig. 1.

♀ allotype. Similar in colour and markings. Passage West, Co. Cork, August, 1933, Dudley Westropp. Pl. A, fig. 3.

Paratypes. ♂, similar in colour and marking. Passage West, Co.

Cork, August, 1933, Dudley Westropp. Pl. A, fig. 2.

♀, green, of a less intense shade and of a greyer tint than in the preceding.

♀, black markings much reduced. Cork, August, 1927, Dudley Westropp. Pl. A, fig. 4.

♀, similar to the example last described. Cork, August, 1935. Pl. A, fig. 5.

♀, similar to the two preceding. Passage West, Co. Cork, August, 1933, Dudley Westropp. Pl. A, fig. 18.

♂, of a greyish-green colour and rather similar to English *par*. Cork, 2.viii.1929. Pl. A, fig. 8.

♀, similar to the example last described. Monkstown, Co. Cork, August, 1931, Dudley Westropp. Pl. A, fig. 7.

♀, similar to the two preceding. Passage West, Co. Cork, August, 1933, Dudley Westropp. Pl. A, fig. 17.

♂, Cork, August, 1926. Similar to the three preceding. Pl. A, fig. 9.

We describe this subspecies from Co. Cork. In our present state of knowledge we are unable to say that all Irish *muralis* are of this form. We have not seen specimens from Galway, and until such are available it would be wrong to assume that they resemble the Cork insects.

Subsp. *westroppi* is a most distinct form, and having regard to the lusitanian element in the Irish fauna we thought it well to examine the forms of *muralis* from Spain and Portugal. Fortunately we found a short series in the Rothschild coll. at Tring. This includes two very bright green insects, one labelled 'Catalonia, 10-11.viii.23' and the other 'Nueva Castilla (Cuenca) 1200 m. Querci'. These are small, like the Cork examples, but are more heavily marked with black, particularly in the area adjoining the orbicular on its basal side. There are two of a pale grey or whitish ground colour, one from Andalusia and one from San Ildefonso, Segovia, 1906, marked as the green ones, and a form very like *par* also from San Ildefonso, 1906. These three are also small. Ten examples from Gibraltar, also small, include two resembling the well-marked white ones and eight with few black markings unlike any British or Irish form. These Spanish examples are smaller than the average of continental *muralis* but do not otherwise resemble subsp. *westroppi*, except in the intensity of the green colour of two of them, which is, however, not the deep rich green of the Cork insects.

Among the Cork insects the following forms known in England occur—*par*, *albida*, *flavescens*, *pallida*, *viridis*. Kane (*Cat. Lep. Ireland, Entom.* xxvii (1894) 209) records *obscura*, but we have seen no Cork example like English *obscura*. Mr. Dudley Westropp had

examples of a rich 'milk chocolate' colour, which were, as we understand, found only on one building near Cork. A rather similar form is figured by Kane on the Plate in the Entomologist illustrating his 'catalogue', fig. 4. This form is not represented at Tring and we have seen no English form like it. We are privileged to figure one of Mr. Westropp's examples of this beautiful form (Pl. A, fig. 6) which we name—

ab. **castanea** ab. n.

♀ holotype Cork, M. S. Dudley Westropp, Aug. 1931.

M. S. Dudley Westropp coll. Dublin. Pl. A, fig. 19.

♀ paratype Cork, M. S. Dudley Westropp, Aug. 1931. Pl. A, fig. 6.

It only remains to discuss the form which has been recorded as *impar* by Kane and others. We figure three examples of this form (Pl. A, figs. 10, 11 and 12). Since the preparation of the Plate the Rothschild-Cockayne-Kettlewell coll. has been enriched by the addition of three examples from the Donovan coll. more closely resembling *impar* than those figured, but we think, nevertheless, that none of these insects is *impar*.

Kane (*Entom.* xxvii, 209) says that Warren, who saw a selection of Cork specimens, acknowledged them to belong to *impar*. Warren in 1884 (*Ent. mo. Mag.* xxi, 22-23) did express this opinion, but in 1909 (*Seitz*, vi, 21) he says quite definitely that *impar* occurs only at Cambridge. The Gloucester examples were unknown, we think, in 1909, and we are glad to think that Warren ultimately shared our view that the Cork forms under discussion are not *impar*.

Kane also says that having examined a fine fresh series taken by Farren at Cambridge he saw some more uniformly speckled, with very distinct black scales, and of a steel-grey coloration, and that he has no Irish examples which correspond with these. Donovan (*Cat. Macrolep. Ireland*, 1936, p. 32) also says he has not any Irish individuals like the Cambridge form, though he certainly had some more like it than any others we have seen.

In these circumstances we think we should name the Cork *impar*-like form, and we describe it as—

ab. **similis** ab. n.

We are content, subject to the observations which follow, to adopt Kane's diagnosis (*Proc. Royal Irish Acad.* 2nd Series, iv, 113)—

'This variety differs from the type most distinctively by its blurred delineations, the sharp black lines of *B. glandifera* being replaced by ill-defined shadings; the black spots on the costa, however, being retained as in type. In the lighter specimens the clear ground colour of the type is replaced by a faded yellow or greenish dusty grey, marked with dusky shadings, the black ante-marginal lines being replaced by a pale one, having a dark external blotch where it touches the inner margin. The darker specimens have a dark olive-grey ground colour, with darker suffused shadings, especially three blotches

external to the pale ante-marginal line, of which the one resting on the inner margin is always deepest in tone.'

Kane's 'pale antemarginal line' is in fact just external to the post-median and there is a paler area internal to the termen and external to the 'three blotches' mentioned by him, which are in fact united in every example known to us. As in *impar* there is a definite darker marginal band and the fringes are less heavily chequered than in other forms of *muralis* with the exception of *par*.

♂ holotype. Cork, 21.viii.1939. Donovan.

♀ allotype. Cork, 5.viii.1912, Plate A, fig. 10.

Paratypes—

♂ Cork, 1.viii.1908. Pl. A, fig. 11.

♂ Cork, 30.vii.1908. Pl. A, fig. 12.

♀ Cork, Aug. 1899, Dudley Westropp.

♀ Bandon, Co. Cork, 18.ix.1941, Donovan, labelled 'impar'.

The last two are of the darker form which we have said are very close to *impar*.

For the last fifteen years we have contemplated the publication of this joint paper. The Plate was prepared some years ago. Such are the vicissitudes of life that we have constantly deferred publication in the hope of obtaining further knowledge, and it may well be that if we could reasonably anticipate the experience we should once have enjoyed of ourselves collecting the examples which would have enabled us to express a considered view on certain problems left unresolved in this paper we should have been more satisfied with our efforts. We hope, however, that we have clearly indicated to our successors some of the problems which require further investigation and we hope they will in turn make discoveries which will enable them to reach an understanding of forms insufficiently known to us.

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## ON *CRYPHIA PERLA* L. AB. *ALBIDA* COLTHRUP

By E. A. COCKAYNE, D.M., F.R.C.P.,

and

HAROLD B. WILLIAMS, Q.C., LL.D.

We think it well to call attention to this little-known aberration, and to figure two examples, which are undoubtedly the types.

These two examples were in the Colthrup coll., and were in the store-box which we have already mentioned in our discussion of *C. muralis*. They were figured in an obscure publication, *The Pageant of*

*Nature*, published in 1923. In Vol. 1, p. 189, appears an article by Colthrup entitled 'In search of the Marbled Moths', and at p. 193, in discussing *C. perla*, he says: 'On one occasion at Eastbourne I was fortunate in discovering a pair of *B. perla*, in which the fore-wings were a pearly white, while the markings were scarcely discernible. For this I propose the varietal name *albida*.' The two insects are figured on the same page, and are undoubtedly the two which we now figure. Both are now in the Rothschild-Cockayne-Kettlewell coll. at Tring, and are labelled 'Eastbourne, bred July, 1903, W. R. Bowden'. This, on one view, is not necessarily inconsistent with the statement by Colthrup that he 'discovered' them.

This must be an exceedingly rare form, and neither of us has seen another example. See Plate A, Figs. 20, 21.

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## BOOK REVIEW

*Collecting, Preparing and Preserving Insects*. Compiled by Bryan P. Beirne. 1955. pp. 133, 108 figs. Cloth. price in G.B. 5s.

While this handbook was written primarily for use in Canada, insect collectors everywhere will find it of interest. In these days of rising costs it is refreshing to see such a well-produced book at such a reasonable cost. While one might have preferred a larger fount for the type, there is little to complain of in the printing, and the correcting of the proofs has been very good; I could only find a few misprints. Over one hundred line drawings illustrate the apparatus and methods described, and if some of these seem superfluous, nevertheless they make their points well. Of the 120 odd pages, two-thirds cover the methods and equipment used for collecting, preserving and storing insects, while the remaining forty pages cover the application of these methods to the collection of the various orders of insects. Ticks, mites, spiders and nematodes are also included. The helminths only merit their place because, for some extraordinary reason, the study of nematodes is part of the function of the Entomology Division of Science Service (the Irish cannot be blamed for this!). There is a section on Formulae which might perhaps have been more extensive. There is a good index which includes three references to 'pitfalls'; the reference to page 85 under this heading presumably refers to the use of the index!

Although not everyone would always agree fully with the methods described and sometimes the suggestions made are inadequate (e.g., the description of ant collecting methods), nevertheless the book contains a great deal of useful information and can be highly recommended. It differs widely enough from the British Museum's Handbook for Insect Collectors to make them valuable companions on any bookshelf.

FERGUS J. O'ROURKE.

## DERMAPTERA &amp; ORTHOPTERA IN KENT

By A. E. GARDNER, F.R.E.S.

The following species were observed between the 14th and 26th August, 1955:—

## DERMAPTERA

*Forficula auricularia* L. Common in débris and old nettle beds at New Romney, Appledore and Ham Street. Under stones on the foreshore at Dungeness. The macrolabic form (var. *forcipata* Steph.) was dominant at Lydden where this species occurred with *Apterygida albipennis*.

*Apterygida albipennis* (Charp.). This local insect was beaten in numbers from nettle and clematis in a sunny valley at Lydden. It appeared to be extremely local, as despite beating a large area it was only found in one small section of hedgerow.

## ORTHOPTERA

*Conocephalus discolor* (Thunb.). Occurred in fair numbers at the Open Pits, Denge Beach, Dungeness.

*Meconema thalassinum* (Degeer). Common at Ham Street on oak.

*Leptophyses punctatissima* (Bosc.). Fairly common at Ham Street on oak.

*Stenobothrus lineatus* (Panz.). Common at Lydden and neighbouring localities.

*Chorthippus brunneus* (Thunb.). Common at Lydden and on suitable ground throughout Romney Marsh.

*C. parallelus* (Zett.). Common at Lydden..

*Myrmeleotettix maculatus* (Thunb.). A few specimens observed on Denge Beach, Dungeness.

## LETTERS TO THE EDITOR

## AN IMPORTANT AMENDMENT

Dear Sir,

In looking through my paper on *Halolaelaps* and *Saprolaelaps* (published in the January 1956 issue of *Ent. Gaz.*) I notice I have referred to the family NEOPARASITIDAE instead of RHODACARIDAE.

Will readers please note that RHODACARIDAE Oudemans, 1902, should be substituted for NEOPARASITIDAE in the Title, the Introduction (three places) and the Summary.

Yours sincerely,

K. H. HYATT.

Dept. of Zoology,  
Brit. Mus. (Nat. Hist.),  
Cromwell Road,  
London, S.W.7.

## BOOK REVIEW

*Die Termiten, Ihre Erkennungsmerkmale und wirtschaftliche Bedeutung*, edited by Hans Schmidt, pp. 309, with 120 illustrations. cloth bound. Leipzig. Akademische Verlagsgesellschaft Geest und Portig K-G. 1955. Price in G.B. £3 3s.

This is a well produced, workmanlike addition to the literature on Termites. Its information is directed specially to the technologist, but it is also invaluable to general entomologists, botanists and chemists, as the chapter headings indicate:—

1. Structure and Distribution of Termites, by Herbert Weidner. This deals with both internal and external structure, and includes a Key to the identification of Families, sub-Families, and the more important Genera, and the distribution of fossil and extant types.
2. The Nests of Termites, by Herbert Weidner, which discusses the structure and function of nests, with special reference to temperature and moisture control.
3. Swarming and the Founding of Colonies, by Adolf Herfs.
4. Termites and Plants, by Adolf Herfs. In addition to dealing with the plants associated with termites, the writer discusses the importance of termites in the formation of soil structures.
5. Methods of Combating Harmful Termites, by Herbert Weidner.
6. *Calotermes flavigollis* Fabr. as 'Guinea Pig', by Karl Gösswald. This is a detailed and fascinating account by an entomologist whose studies are well known to myrmecologists, of the method of rearing *C. flavigollis* for breeding and research purposes. Gösswald deals with the method of collection, the types of observation nest, the precautions that have to be taken to guard against escape, and the diseases captive termites are heir to. An important industrial and commercial reason for such experiments is the testing out of resistance to termite attacks of a variety of materials, such as textiles, cellophane, and metals.

7. Termite Attacks on Wood, with special reference to Industrial Timber, by Hans Schmidt.

8. The Chemistry of Wood-preservation and Methods of Application, by Wilhelm Sandermann. This chapter includes extensive tables showing the botanical and popular names of trees, their distribution and degree of resistance to termites.

Each chapter is followed by references, and both the text illustrations and photographs are valuable adjuncts to the text itself. It may also be worth while mentioning that the German is lucid, so that the language in general presents fewer difficulties than is often the case with technical German books.

A. N. BRANGHAM.

## THE LARVA OF *NOTIDOBIA CILIARIS* (L.), (TRICHOPTERA: SERICOSTOMATIDAE)

By HILMY M. HANNA, B.Sc., M.Sc., F.R.E.S.

(Zoology Department, University of Reading)

On the 19th March, 1953, fifty-seven full-grown larvae were collected from a slow-running stream at Lyme Park, Disley, near Manchester. The larvae were found crawling on the sandy bottom underneath stones, together with the larvae of *Sericostoma personatum*. The larvae of the latter species are normally found in fast-running streams.

The adults emerged in the laboratory between the 12th May and the 17th June. These Lancashire larvae were checked against specimens collected from the Kennet Canal and the Whitewater River in the Reading area.

The following details are derived from a study of a large number of fully-grown larvae.

### *Case*

The curved and tapered cases are up to 15 mm. in length and 4 mm. wide at the anterior end. The posterior end of the case has a dark brown silken plate, in the centre of which there is a small hole. The cases are built of grains of sand and have a very smooth outer surface.

### *Larvae*

The larva is eruciform. The larvae examined measured up to 13 mm. long and 3 mm. wide.

### *Head*

The head is hypognathous, broad, short and dark brown, with a lighter pattern on the anterior surfaces of the genae and the aboral end of the fronto-clypeus. The posterior surfaces of the genae are dark brown except for the area bordering the gular sclerite, which is pale yellow in colour. The gular sclerite is chestnut brown and has a concave ventral margin and a markedly convex dorsal margin. As there is no genal suture the two genae are fused together above the gular sclerite.

### *Labrum*

The ventral margin of the labrum is almost straight, with a small central protuberance which is not always present. On each side there are three long setae as well as some smaller setae and hairs. The tormae are long, heavily sclerotised and bent inwards.

### *Mandibles*

The mandibles are asymmetric and each bears two long setae near the base. The right mandible has three blunt teeth, while the left mandible has four teeth of which the outermost is smaller than the others. Each mandible has a brush on the inner surfaces.

### *Maxilla*

The cardo and stipes each bear two setae. There is a small additional sclerite between the cardo and stipes. The maxillary palp has five segments.

### *Thorax*

The pronotum is dark brown, entirely sclerotised, and has a median longitudinal suture. The antero-lateral margin of the pronotum has a prolongation. The anterior two-thirds of the pronotum and its lateral margins carry long hairs. The mesonotum is sclerotised except for a narrow posterior region, and has a median longitudinal suture. The anterior half of the mesonotum is darker than the posterior half. In some specimens the mesonotum is dark brown except for the posterolateral margins, which are yellowish brown. The metanotum is soft and bears two transverse rows of long dark hairs. There is no prosternal horn or prosternal sclerite. The propleuron is dark brown, with a dark longitudinal band. The meso- and metapleura are transparent and each bears a dark longitudinal band at right angles to the dark transverse band at the base of the coxa.

### *Legs*

The prothoracic leg is short and robust, with a much flattened femur. The inner surface of the trochanter, femur and tibia bear small spines. The mesothoracic leg is shorter than the metathoracic leg. All the legs carry many hairs, except on the tarsi where they are reduced in number.

### *Abdomen*

On the first abdominal segment there are three protuberances of which the dorsal is broad and devoid of setae, while each of the lateral ones bears a single seta. In some of the specimens the lateral protuberances were devoid of setae and in place of them arose small spines at their margins. The abdominal gills are present on segments 1 to 8. The lateral line is represented by small tubercles on the third to the eighth abdominal segments. On the eighth abdominal segment the sclerotised tubercles are larger than those on the other segments, and they are 19 to 20 in number. The anal sclerite is absent. There are many long fine hairs on the tergum of the ninth abdominal segment. The anal claw is formed of three superimposed claws.

The larvae of *Notidobia ciliaris* can be easily confused with those of *S. personatum*, especially as the latter may exhibit a similar darkening of the mesonotum. However, the greater sclerotisation of the mesonotum with the well defined median longitudinal suture is normally enough to separate the larvae of *N. ciliaris* from those of *S. personatum*. Another valuable character is the well defined form of the gular sclerite of *N. ciliaris*.

## SUMMARY

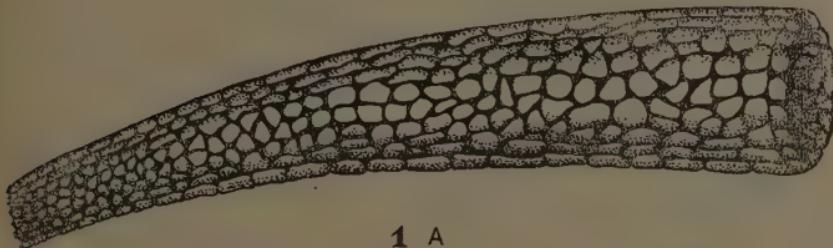
The larva of *Notidobia ciliaris* (L.) is described and figured and means for its identification are given.

## REFERENCES

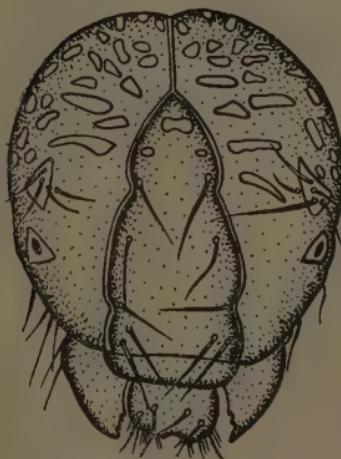
**LESTAGE, J. A.**, 1921, in Rousseau, E. *Les larves et Nymphes Aquatiques des Insectes d'Europe*. Brussels.

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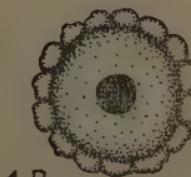
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1 A



2



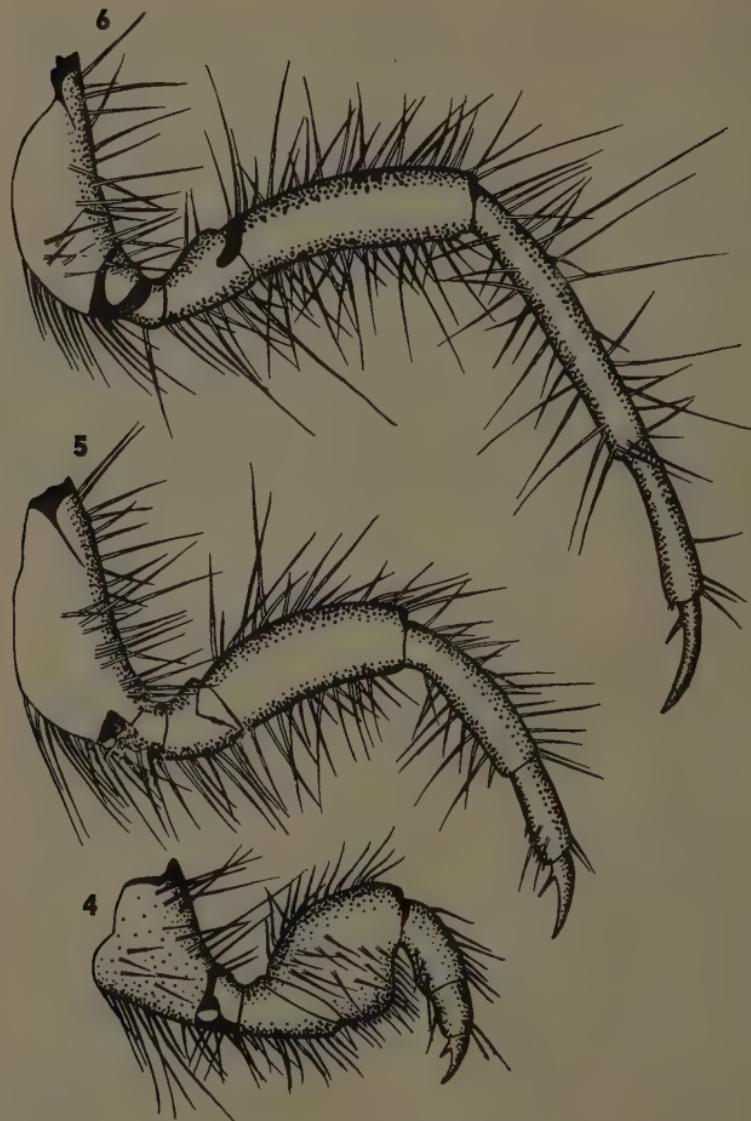
1 B



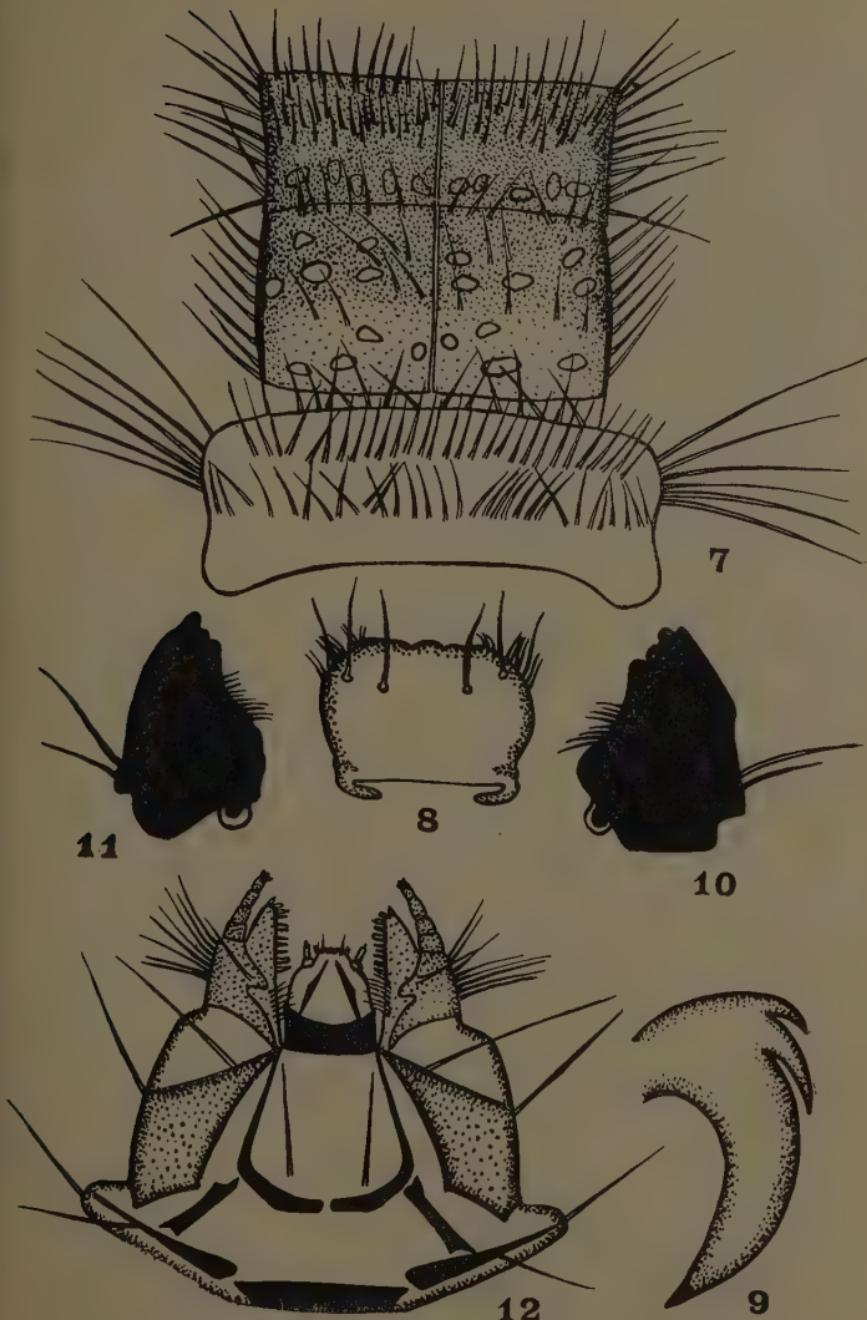
3

*NOTIDOBIA CILIARIS* (L.).

Figs. 1-3. (1) (a) Larval case. (b) Posterior end of case from behind.  
 (2) Head from the front. (3) Head from behind.

*NOTIDOBIA CILIARIS* (L.).

Figs. 4-6. (4) Prothoracic leg. (5) Mesothoracic leg. (6) Metathoracic leg.



*NOTIDOBIA CILIARIS (L.).*

Figs. 7-12. (7) Thoracic nota from above. (8) Labrum. (9) Anal claw. (10) Left mandible. (11) Right mandible. (12) Labium and maxillae.

## BOOK REVIEW

*The Physiology of Diapause in Arthropods*, by A. D. Lees, 1955 (Cambridge Monographs in Experimental Biology No. 4). Size, 8½ in. by 5½ in., x+151 pp., 7 tables, 25 figs. Cambridge University Press, London. Price, 12s. 6d.

This is the second of the series to be of particular interest to entomologists, and it should certainly be read by all those who undertake systematic breeding work. For diapause is one of the chief factors which determine the seasonal distribution of insect species, and a knowledge of its causes and effects is essential for the successful culture of all but the continuous-breeding forms. One is tempted to wonder how many lepidopterous pupae may each winter be spared the miserable fate of desiccation in diapause, due to ill-considered 'forcing', if this little volume is widely read in amateur circles.

The book opens with the acceptance of Shelford's definition of diapause as a spontaneous arrest of development or activity, as opposed to the quiescence directly controlled by unfavourable conditions; but it is recognized that borderline cases exist. The factors responsible for the onset of diapause are considered in the second chapter and chapter three, dealing with the inheritance of diapause, tells how populations showing graded response can arise from crosses between pure univoltine and bivoltine stock. In chapter four, the factors determining the termination of diapause are examined, and it is here that the reader comes to realize how little is as yet known concerning the basic biochemistry of the 'cold reaction', the factor which regulates the duration of diapause. The rôle of water metabolism in arrest of growth is next considered and mention is made of the extraordinary chironomid *Polypedilum vanderplanki*, the larva of which is able to survive many years in the completely desiccated condition. Chapter six deals with the special interactions which govern the behaviour and metabolism of host and parasite, and there follows in chapters seven and eight a more general consideration of metabolism in the dormant insect and the humoral regulation of diapause.

The final chapter deals with the primary function of diapause, the regulation of the seasonal distribution of organisms to correspond with the climatic cycles of their environment. There follows an impressive list of references to the literature and a subject index.

B. P. MOORE.

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VOLUCELLA ZONARIA (PODA) IN MIDDLESEX  
(DIPT: SYRPHIDAE)

On the 1st and 25th August, 1955, I caught a female of this species on Michaelmas Daisies in my garden at this address. On 27th August a male specimen was taken.

22 Harlington Road East,  
Feltham, Middlesex.

E. W. CLASSEY.

## SOME MACROLEPIDOPTERA FROM CO. ARMAGH, NORTHERN IRELAND

By CAPT. W. S. WRIGHT, B.Sc., F.R.E.S.

The following list from Church Hill, near Moy, Co. Armagh, is the result of one visit in April, three in June, one in July, two in August, and one in September during the years 1952 and 1953, using my portable generator and M.V. bulbs. Church Hill lies in typical Lough Neagh fen country, the soil being peat covered with heather and birch association, also some mixed woodland and rhododendron scrub,

### SPHINGIDAE

<i>Laothoe populi</i> (L.).	Poplar Hawk. Common.
<i>Smerinthus ocellatus</i> (L.).	Eyed Hawk. Common.
<i>Dilephila elpenor</i> (L.).	Large Elephant Hawk. Common.
<i>Macroglossa stellatarum</i> (L.).	Humming-bird Hawk. Few.

### NOTODONTIDAE

<i>Cerura furcula</i> (Clerk.).	Sallow Kitten. Few.
<i>C. vinula</i> (L.).	Puss. Common.
<i>Phoebia gnoma</i> (Fabr.).	Lesser Swallow Prominent. Common.
<i>Notodontia ziczac</i> (L.).	Pebble Prominent. Common.
<i>N. dromedarius</i> (L.).	Iron Prominent. Common.
<i>Lophopteryx capucina</i> (L.).	Coxcomb Prominent. Common.
<i>Pterostoma palpina</i> (L.).	Pale Prominent. Few.
<i>Phalera bucephala</i> (L.).	Buff-tip. Common.

### POLYPLOCIDAE

<i>HabroSYne derasa</i> (L.).	Buff-arches. Few.
<i>Thyatira batis</i> (L.).	Peach-blossom. Few.
<i>Tethea duplaris</i> (L.).	Lesser Satin Lutestring. Few.

### LASIOCAMPIDAE

<i>Lasiocampa quercus</i> (L.).	Oak Eggar. Common.
<i>Macrothylacia rubi</i> (L.).	Fox. Common.
<i>Phaludoria potatoria</i> (L.).	Drinker. Common.

### SATURNIIDAE

<i>Saturnis pavonia</i> (L.).	Emperor. Common.
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### DREPANIDAE

<i>Drepana falcataria</i> (L.).	Pebble Hook-tip. Common.
<i>D. lacertinaria</i> (L.).	Scalloped Hook-tip. Common.
<i>Cilix glaucata</i> (Scop.).	Chinese-character. Common.

### ARCTIIDAE

<i>Spilisoma lubricipeda</i> (L.).	White Ermine. Common.
<i>S. lutea</i> (Hufn.).	Buff Ermine. Common.
<i>Cynnia mendica</i> (Clerck).	Muslin Ermine. Common.
<i>Phragmatobia fuliginosa</i> (L.).	Ruby Tiger. Common.
<i>Arctia caja</i> (L.).	Garden Tiger. Common.
<i>Hypocrita (Callimorpha) jacobaeae</i> (L.).	Cinnabar. Common.

### CARADRINIDAE

<i>Colocasia coryli</i> (L.).	Nut-tree Tuffet. Common.
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*Apatele leporina* (L.).  
*A. megacephala* (Schiff.).  
*A. psi* (L.).  
*A. rumicis* (L.).  
*Agrotis exclamationis* (L.).  
*A. ypsilon* (Rott.).  
*Lycophotia porphyrea* (Schiff.).  
*Amathes agathina* (Dup.).  
*A. baja* (Schiff.).  
*A. c-nigrum* (L.).  
*A. stigmatica* (Hubn.).  
*Diarsia brunnea* (Schiff.).  
*D. festiva* (Schiff.).  
*D. rubi* (View.).  
*Ochropleura plecta* (L.).  
*Axylia putris* (L.).  
*Triphaena comes* (Hubn.).  
*T. pronuba* (L.).  
*T. janthina* (Schiff.).

*Lampra fimbriata* (Schreber).

*Anaplectoides prasina* (Schiff.).  
*Polia nebulosa* (Hufn.).  
*Mamestra brassicae* (L.).  
*Ceramica pisi* (L.).  
*Diataraxia oleracea* (L.).  
*Hadena thalassina* (Hufn.).  
*Charaeas* (*Cerapteryx*) *graminis* (L.).  
*Luperina testacea* (Schiff.).  
*Thalpophila matura* (Hufn.).  
*Proctis strigilis* (Clerck).  
*Proctis latrunculus* (Schiff.).  
*P. fasciunculus* (Haw.).  
*Xylophasia obscura* (Hubn.).  
*X. crenata* (Hufn.).  
*X. lithoxylea* (Schiff.).  
*X. monoglypha* (Hufn.).  
*Apamea sordens* (Hufn.).  
*Celaena secalis* (L.).  
*Allophyes* (*Meganephria*) *oxyacanthae* (L.).  
*Euplexia lucipara* (L.).  
*Phlogophora meticulosa* (L.).  
*Celaena haworthii* (Curt.).  
*C. leucostigma* (Hubn.).  
*Hydraecia oculata* (L.).  
*H. lucens* (Frey.).  
*H. micacea* (Esp.).  
*Gortyna flavago* (Schiff.).  
*Nonagria typhae* (Thunb.).  
*Arenostola pygmaea* (Haw.).  
*Leucania pallens* (L.).  
*L. impura* (Hubn.).  
*L. comma* (L.).  
*Amphipyra tragopogonis* (L.).  
*Cerastis rubricosa* (Schiff.).  
*Orthosia gothica* (L.).

Miller. Three.  
 Poplar Dagger. Common.  
 Grey Dagger. Common.  
 Knot-grass Dagger. Common.  
 Heart and Dart. Few.  
 Dark Sword Grass. Few.  
 True Lovers' Knot. Common.  
 Heath Rustic. Common.  
 Dotted Clay. Few.  
 Setaceous Hebrew Character. Common.  
 Square-spotted Clay. Few.  
 Purple Clay. Few.  
 Common Ingrailed Clay. Common.  
 Small Square-spot. Common.  
 Flame Shoulder. Common.  
 Flame Rustic. Common.  
 Lesser Yellow-underwing. Few.  
 Common Yellow-underwing. Common.  
 Lesser Bordered Yellow-underwing.  
 Few.  
 Broad Bordered Yellow-underwing.  
 Few.  
 Green Arches. Few.  
 Grey Arches. Few.  
 Cabbage Dot. Common.  
 Broom Brocade. Common.  
 Bright-line Brown-eye. Common.  
 Pale-shouldered Brocade. Common.  
 Antler. Common.  
 Flounced Rustic. Few.  
 Straw Underwing. Few.  
 Marbled Minor. Few.  
 Tawny Minor. Few.  
 Middle-barred Minor. Few.  
 Dusky Brocade. Common.  
 Cloud-bordered Brindle. Common.  
 Light Arches. Common.  
 Dark Arches. Common.  
 Rustic Shoulder-knot. Few.  
 Common Rustic. Common.  
*Allophyes* (*Meganephria*) *oxyacanthae* Green-brindled Crescent. Common.  
 Small Angle-shades. Few.  
 Large Angle-shades. Few.  
 Haworth's Minor. Few.  
 Brown Crescent. Few.  
 Common Ear. Common.  
 Large Ear. Common.  
 Rosy Rustic. Common.  
 Frosted Orange. Common.  
 Bulrush Wainscot. Common.  
 Small Wainscot. Common.  
 Common Wainscot. Common.  
 Smoky Wainscot. Common.  
 Shoulder-striped Wainscot. Common.  
 Mouse Moth. Common.  
 Red Chestnut. Few.  
 Hebrew Character. Common.

<i>O. stabilis</i> (Schiff.).	Common Quaker. Common.
<i>O. incerta</i> (Hufn.).	Clouded Quaker. Common.
<i>O. munda</i> (Schiff.).	Twin-spot Quaker. Few.
<i>O. gracilis</i> (Schiff.).	Powdered Quaker. Common.
<i>Cosmia trapezina</i> (L.).	Dun Bar. Few.
<i>Citria lutea</i> (Stroem).	Pink-barred Sallow. Few.
<i>Cirrhia icteritia</i> (Hufn.).	Common Sallow. Few.
<i>Xylocampa areola</i> (Esp.).	Early Grey. Few.
<i>Cucullia umbratica</i> (L.).	Common Shark. Common.

### PLUSIIDAE

<i>Eustrotia uncula</i> (Clerck).	Silver Hook. Few.
<i>Rivula sericealis</i> (Scop.).	Straw Dot. Common.
<i>Plusia chrysitis</i> (L.).	Burnished Brass. Common.
<i>P. bractea</i> (Schiff.).	Gold Spangle. Common.
<i>P. festucae</i> (L.).	Gold Spot. Common.
<i>P. iota</i> (L.).	Plain Golden Y. Common.
<i>P. v-aureum</i> (Hubn.) ( <i>pulchrina</i> (Haw.)).	Beautiful Golden Y. Common.
<i>P. gamma</i> (L.).	Silver Y. Common.
<i>P. interrogationis</i> (L.).	Northern Silver Y. Common.
<i>Abrostola tripartita</i> (Hufn.).	Light Spectacle. Common.
<i>A. triplasia</i> (L.).	Dark Spectacle. Common.
<i>Hypena proboscidalis</i> (L.).	The Snout. Common.

### BREPHIDAE

<i>Alsophila aescularia</i> (Schiff.).	March Looper. Common.
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### GEOMETRIDAE

<i>Pseudoterpnia pruinata</i> (Hufn.).	Grass Emerald. Common.
<i>Geometra (Hopparchus) papilionaria</i> (L.).	Large Emerald. Common.
<i>Hemithea strigata</i> (Müll.) ( <i>aestivaria</i> (Hubn.)).	Common Emerald. Common.

### STERRHIDAE

<i>Cosymbia pendularia</i> (Clerck).	Birch Mocha. Few.
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### HYDRIOMENIDAE

<i>Calocalpe undulata</i> (L.).	Scallop Shell. Few.
<i>Lygris testata</i> (L.).	Common Chevron. Few.
<i>Cidaria fulvata</i> (Forst.).	Barred Yellow. Common.
<i>Chlorocrysta miata</i> (L.).	Autumn Green Carpet. Common.
<i>Xanthorhoe designata</i> (Hufn.).	Flame Carpet. Common.
<i>Calostigia pectinataria</i> (Knoch).	Green Carpet. Common.
<i>Euphyia unangulata</i> (Haw.).	Sharp-angled Carpet. Common.
<i>Lyncometa ocellata</i> (L.).	Purple-bar Carpet. Few.
<i>Europilia badiata</i> (Schiff.).	Rose Carpet. Common.
<i>Coenotephria derivata</i> (Schiff.).	Streamer. Common.
<i>Eupithecia centaureata</i> (Schiff.).	Lime-speck Pug. Common.

### SELIDOSEMIDAE

<i>Abraxas grossulariata</i> (L.).	Common Magpie. Common.
<i>Bapta punctata</i> (Fabr.) ( <i>temerata</i> (Schiff.)).	Clouded Chalk. Common.
<i>Erannis progemmaria</i> (Hueb.) ( <i>marginaria</i> (Borkh.)).	Dotted Border. Common.
<i>Deuteronomos alniaria</i> (L.).	Canary-shouldered Thorn. Common.
<i>Selenia bilunaria</i> (Esp.).	Early Thorn. Common.
<i>Hygrochroa (Apeira) syringaria</i> (L.).	Lilac Beauty. Common.
<i>Gonodontis bidentata</i> (Clerck).	Scalloped Hazel. Common.

## NYMPHALIS XANTHOMELAS ESPER (LEP: NYMPHALIDAE) EXTENDING ITS RANGE

It is of considerable interest to British entomologists to learn that *Nymphalis xanthomelas* Esper has again been taken far from its usual location in Eastern Europe. This time it has turned up in southern Sweden, a specimen which was captured at Sandhammaren, S.E. Scania, on 12th September, 1954, having established a new record for Sweden (RAMBRING, H., 1955, *Opusc. ent.*, **20**: 209).

The discovery of this species in Kent, by Miss McDermott, created quite a sensation in 1953 (HESLOP, I. R. P., 1954, *A Butterfly new to the British List, Nymphalis xanthomelas Esp., Ent. Gaz.*, **5**: 9), and its occurrence the following year in Scandinavia strengthens the belief that the Kent specimen was a genuine migrant, or the progeny of a migrant.

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## BOOK REVIEW

*A Morphological Study of a Relic Dragonfly Epiophlebia superstes Selys (Odonata, Anisozygoptera)*, by Syoziro Asahina. 1954. pp. 4 x 153, 71 plates of line drawings. The Japan Society for the Promotion of Science, Tokyo. Price £1 10s.

The Japanese dragonfly *Epiophlebia superstes* represents a relic of the suborder Anisozygoptera which had flourished in the Mesozoic era. This suborder is now only represented by *E. superstes* and the Himalayan *E. laidlawi* Tillyard, the latter known only by the larva. Dr. Asahina's work will, therefore, not only be of the utmost importance to Odonatists, but to all students of phylogeny.

Not only is this work a comparative morphology of the Odonata, with special reference to *E. superstes*, but the author has made comparative descriptions with *Davidius nanus* (Selys) (Anisoptera) and *Mnais strigata* Selys (Zygoptera), paying special attention to their sclerites, muscles and internal organs from the view-point of homology. Over eighty pages are devoted to the morphology of the imago, seventeen pages to the morphology and early stages of the larva. It is interesting to learn that the larva of *E. superstes* is equipped with a stridulating organ, this being unique among the Odonate larvae. The Anisopterous, Zygopterous and unique characters of the Epiophlebiidae are discussed, also the systematic relationship and phylogenetic position of the Epiophlebiidae. Nine pages of references are given and a contents index is provided. This work is well produced and the illustrations are of a high standard.

A.E.G.

# A NEW NAME FOR *TACHYS PICEUS* EDMONDS (COL., CARABIDAE) AND A NOTE ON THE SEPARATION CHARACTERS OF THE SPECIES.

By B. P. MOORE, D.Phil., F.R.E.S.

*Tachys piceus* Edmonds (1934) was first described from specimens taken in the New Forest, Hampshire. The insect was well known to the earlier coleopterists, who regarded it as a form of *T. bistriatus* (Duft. 1812), but there is little doubt that the describer was justified in raising it to full specific rank.

Unfortunately, Edmonds' name is preoccupied by *T. piceus* Dalla Torre (1877), which was erected originally for a 'variety' of *bistriatus* but which is now regarded as an absolute synonym of that species.

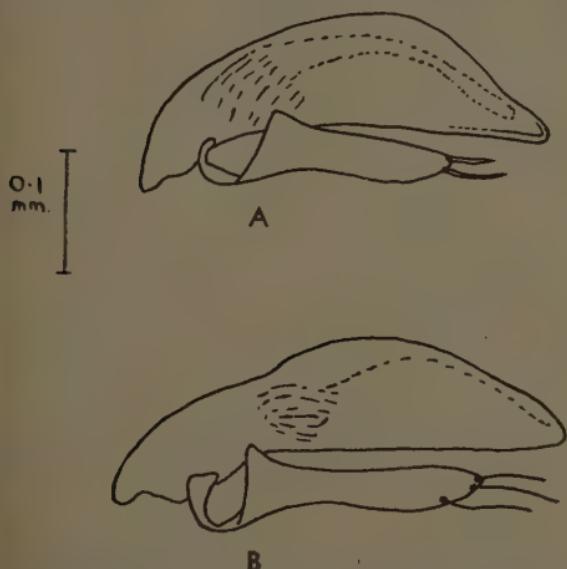


Fig. 1. Male genitalia of *Tachys* (Steph.) spp., left lateral view. (a) *edmondsi* nom. nov. (b) *bistriatus* (Duft.).

Neither has the insect been reported as yet from outside Britain, so far as I am aware. It belongs to the subgenus *Eotachys* Jeann. (1941), and its nearest relative is undoubtedly *T. (E.) bistriatus* (Duft.), from which it may be separated by its much shorter antennae. I have also noted differences between the male genitalia of the two species (Fig. 1). *T. edmondsi* has this organ much less elongate, generally, and the apex of the median lobe is more acuminate. Furthermore, the left paramere bears but

A strict interpretation of the rules of nomenclature would require the renaming of Edmonds' species and, since Dalla Torre's name is already established in the catalogues, this step is essential if confusion is to be avoided. I therefore propose *edmondsi* nom. nov. for this purpose.

*Tachys edmondsi* used to occur freely in moist sphagnum at the type locality and probably continues to do so, although I know of no recent record.

two apical setae, which are short, stout and close together. With *bistriatus* the setae are longer and more slender, and there is a third, subapical seta placed some distance from them. Perhaps I should add that I have examined only a single male *edmondsi* but, judging by the general trend in the genus, no great variation in these characters is to be expected. In this connection it is interesting to note that my figure for *bistriatus* is substantially in agreement with that given by Jeannel (1941) for the same species.

I wish to thank Mr. J. L. Henderson for giving me the opportunity to study specimens (collected by the late E. C. Bedwell) from his collection.

*Montrose, Stoneyfields,  
Farnham, Surrey.  
2nd January, 1956.*

#### REFERENCES

DALLA TORRE, K. von, 1877. Die Käfer von Oberösterreich, 8. Jahr.-Ber. Ver. Naturk., Linz, p. 57.

EDMONDS, T. H., 1934. A species of *Tachys* (Coleoptera, Carabidae) from the New Forest, new to science. Ent. mon. Mag. 70:7.

JEANNEL, R., 1941. Coléoptères Carabiques I, Faune de France. 39:426-429.

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## BOOK REVIEW

*Lepidoptera of Somerset*, by A. H. Turner, 1955, pp. (4), 188 (8). Wrappers. Published by the Somersetshire Archaeological and Natural History Society. Price 10s. 6d.

This is an extremely workmanlike and well constructed local list. The literature has been carefully combed, and the comments on the inevitably resulting curiosities are sensible and cautious. The names are carefully presented and (thank goodness!) the authors' names are given—and very carefully given too, parentheses being used in the appropriate places. The whole of the Lepidoptera is dealt with, not just the 'Macros'. All this would not be a subject for more than passing comment in any of the 'other Orders'—but in a local list of Lepidoptera it is a matter for commendation and, we hope, emulation.

The printing and layout are clear and good and the typeface pleasant.

The price is reasonable, and the Somersetshire Archaeological and Natural History Society is to be congratulated on the production of this list and on their luck in having Mr. A. H. Turner to produce it so ably for them.

E.W.C.

## ADDITIONS TO THE MACROLEPIDOPTEROUS FAUNA OF SUSSEX SINCE 1932

By G. HAGGETT

In 'The Entomologist' 1932 Robert Adkin listed all the lepidoptera recorded for Sussex since publication of the Victoria History in 1905, and gave further localities for those species listed earlier, but whose distribution was little known; he also added records of migrants and less common species.

With our knowledge of at least the 'macros' now so much improved, the need for a thorough revision of the Sussex list is not only desirable but is becoming increasingly urgent. Until this gigantic task is attempted, and also to facilitate it, it is as well to publish periodic summaries occasioned either when a considerable number of additions have accrued or when so long an interval warrants it.

The present composition of the Sussex list lies scattered in numerous works and publications. The first attempt to form a comprehensive catalogue of the Sussex species was made by Jenner in 1885-6, but the fauna of East Sussex had prior claim and no localities were given for the western division. About 1886 W. H. B. Fletcher published his 'List of Lepidoptera observed in West Sussex', in which a good many species were represented and other records collated. In A. J. Wightman's copy of this rare list the author had written in copious annotations on the species already described, and also added further species and their localities. Not long after the appearance of Fletcher's list the Rev. C. D. Ash brought out 'A Further List of Macro-lepidoptera observed in West Sussex', being a supplement to Fletcher's list by way of adding new species and providing further notes on the distribution and occurrence of Fletcher's more local ones. A 'Lepidoptera of Bognor', by Alfred Lloyd, published in the Proc. West Sussex Nat. Hist. Soc., about 1889 contains much useful, although unfortunately brief, information on species encountered within a few miles of Bognor.

By the end of the last century various writers, both resident and collecting visitors, had contributed notes on the Sussex fauna to the entomological journals, and articles of local interest continue to appear to the present day.

In 1905 the admirable 'Victoria County History of Sussex Lepidoptera' was published, consisting of records and notes collated by Fletcher in collaboration with many of the Sussex workers and others: the history is based closely on the earlier lists of Fletcher and Jenner, and also incorporates that of Rev. Ash; the section dealing with the butterflies was distorted\* by Goss, who also contributed a deal of pompous footnotes on the more conspicuous and larger moths. There is much valuable information in the list, which

\* In my undated copy at any rate.

is remarkable for the inclusion of so many rare and local species, although at the same time some fanciful myths are perpetuated. It is still a useful general guide, but it is very obviously out of date in relation not so much to species as to their localities and distribution, which have since changed enormously. Fletcher, writing in 1911, himself indicated how out of date the History was even then, for although the date of publication is 1905, few records later than the earlier lists are included.

Adkin's work in 1932 is mainly concerned with his more personal knowledge of records for East Sussex, and notes on the western species appear to be almost entirely due to A. J. Wightman. It was characteristic of Adkin that he made no mention of his own 'Butterflies and Moths of Eastbourne', published 1928-31, possibly one of the finest local lists ever produced and certainly one of the best illustrated. Since 1932 numerous articles both of specific and general interest have appeared in the various journals, but it is due mainly to the energies of Wightman that recent comprehensive notes are available on the West Sussex Noctuae. A valuable contribution to the knowledge of our Geometridae is made in a paper entitled 'Geometers of Storrington, W. Sussex', by Dr. Robertson, in the Ent. Rec. 1934.

How thoroughly the Sussex fauna had been explored to 1932 is well shown by analysis of the species added since; most of these comprise species that were new also to Britain, others had not till recently been distinguished from closely allied species, while others again are exceedingly rare vagrants or even possibly the result of chance introduction; very few are long-standing indigenous species that had been overlooked. It is noticeable that the bulk of these newcomers have been encountered only during the past ten years, when astonishing changes have taken place both in the natural fauna and in the techniques employed in working it.

No account is made here to revise species on existing lists despite the strong temptation to give the altered status of such interesting insects as *N. albula*, *N. algae*, *M. lunaris*, *H. pinastri* and *T. fimbrialis*, and to comment on the curious inland heath form of *A. vestigialis*.

*Leucoma v-nigrum* Fab. A male at light, Arundel, 7.7.46.

*Euplagia quadripunctaria* (Pod). A female with yellow hind wings at Arundel. August, 1946 (P. Challen).

*Cryphia divisa* Esp. A male at light, Arundel, 12.8.53.

*Hadena albimacula* (Borkh.). A. J. Wightman tells me this formerly occurred on the Sussex side of Dungeness but was never recorded, and as it does not seem to be sought there now it may well remain unknown.

*Actinotia polyodon* (Clerck). A worn male at light, Tilgate 5.6.54; a better example (unrecorded) in East Sussex the same year.

*Procas latruncula* (Schiff). Very common in West Sussex.

*Hydraecia hucherardi* Mab. The history is well known of this most recent addition to the British fauna. It was taken first at Hailsham in 1951 and has since been found commonly but locally in the marshes east of Rye.

*Arenostola elymi* (Treits). Beirne states (Origin and History of the Brit. Macrolepidoptera) 'it has been recorded for Sussex', but I do not know the original record. Recently, however, A. L. Goodson took several moths at light at Camber (July, 1955), and these appear to be the first authentic examples from the south coast of Britain.

*Graptilotha lapidea* Hb. Two moths at Eastbourne in October, 1954, another the following year.

*Calophasia lunula* (Hufn.). The first undisputed British example was taken by W. Rait-Smith on the downs near Shoreham in 1939. The next at Bexhill in 1950. Since then the larvae have been very common at Shoreham, Eastbourne, Bexhill, Hastings and Pevensey.

*Eublemma parva* (Hb.). Seventeen moths at Arundel in May, 1953, others at Hastings in the same month.

*Jaspidia deceptoria* Scop. A male at light, 'N.E. Sussex', 13.6.52. (McNulty & Wild.)

*Eustrotis olivana* (Schiff.). One at light at Hailsham, 25.6.53. (S. Coxey.)

*Tathorhynchus exsiccata* Led. A worn female at light, Arundel, 2.6.55.

*Aplasta ononaria* (Fuessl.). One at light, Tilgate, 23.8.47. (Wild.)

*Oporinia christyi* Prout. Frequent at Arundel and in woodlands of West Sussex.

*Oporinia autumnata* (Borkh.). Usually less common in the Arundel woods than others of the genus. Recorded from 'mid-Sussex' by De Worms.

*Thera variata* (Schiff.). The 'variata' of the Vic. Hist. clearly refers to *obeliscata* (Hb.). *T. variata* is frequent enough at Arundel and has been taken in various parts of West Sussex despite the local absence of Spruce; it is more often seen in the autumn.

*Euphyia luctuata* (Schiff.). A pair taken by B. Embry at Uckfield in 1950 coincided with the rediscovery of this species in Kent. Since recorded from 'mid-Sussex' in 1953, but other captures remain unpublished.

*Eupithecia intricata* Zett. f. *arceuthata* Freyer. Common amongst Cupressus in gardens at Arundel and Rustington, but evidently scarce on Juniper on the downs at Upwaltham. Recorded also from Haywards Heath.

*Eupithecia millefoliata* Rössl. Larvae were discovered in 1951 from Brighton to Selsey Bill; at Arundel on the river banks, at Shoreham, Selsey, Clymping, Rustington, and at Chichester (extremely abundant in 1955), and Sompting along the by-pass roads. Recorded from Lewes (Cockayne) and Pulborough, the only inland locales.

*Aegeria andrenaeformis* (Lasp.). Larval borings common enough on the chalk hills around Arundel.

## BOOK REVIEWS

*The Wing-venation of the Orthoptera Saltatoria*, by D. R. Ragge. 1955. pp. 159, 106 text figs. Published by the Trustees of the British Museum (Natural History). Price £2.

In this important work the author has attempted a formidable task—to determine the homologies of Saltatorian wing-veins and to apply a uniform unmodified Comstock-Needham terminology. Students who disagree with the 'pre-tracheation' theory may have grounds for criticism; but there can be no doubt that Dr. Ragge's work fills an enormous gap in insect morphology, and that it will greatly facilitate studies on the phylogeny and systematics of the group.

In the course of this study over six hundred Saltatorian genera were examined, these including all the winged families and almost all the winged subfamilies. A brief account of the Dictyopteran wing-venation is given and new ground is covered by the examination of representative Mantoidea nymphal wing-pads.

One chapter is devoted to classification, the Orthoptera (*s. lat.*) being regarded as containing four groups of ordinal value: Grylloblattodea, Saltatoria, Phasmida and Dictyoptera. Following chapters clearly deal with 'Material', 'Technique' and 'General account of Orthopteroid Wing-venation'. The main body of the work is contained in sixteen chapters, then follows a chapter headed 'General Conclusions', which includes a key to the modern winged families of Saltatoria. Two pages of references are given, a list of the genera examined, and an index is included.

The author is to be congratulated on his clear and excellent illustrations, the publishers on producing a well-printed book which is a joy to handle.

A.E.G.

*Zur Morphologie der Schmetterlingseier*, by E. Doering. 1955. pp. 154, 3 coloured and 58 plain plates. Cloth. Price £3 5s.

This attempt at a classification of the eggs of Lepidoptera has the great merit of being abundantly illustrated. It contains over 2,500 sketches of eggs and micropylar details, and whatever the merits or demerits of the text these carefully executed illustrations are bound to be of the greatest value to any subsequent worker in this field.

It is difficult to comment on the keys as they are, of course, to be proven only by use and, in the case of keys as extensive as those contained in this work, by extensive use.

The introductory chapters are useful and interesting; the production is good.

E.W.C.

## A NEW RECORD OF *SYMPETRUM* *MERIDIONALE* (SELYS) (ODONATA: LIBELLULIDAE)

By A. E. GARDNER, F.R.E.S.

Although *Sympetrum meridionale* (Selys) is a migrant species and occurs commonly in south-west Europe, there are only two authentic British records. Of these, Lucas (1900, p. 309) says: 'The claim of this insect to a position on the British list rests on two females of old date. One of these, from "near London", was in Evans' Collection, which now forms part of that of Mr. C. W. Dale, of Glanvilles Wootton, in Dorset. The other, from the "South of England", was in Wailes' Collection, and of it Mr. McLachlan says: "It is truly this species, and bears evidence of having been sent to Mr. Wailes by the late Mr. J. C. Dale, for it bears a label *meridionalis* in the handwriting of the latter".'

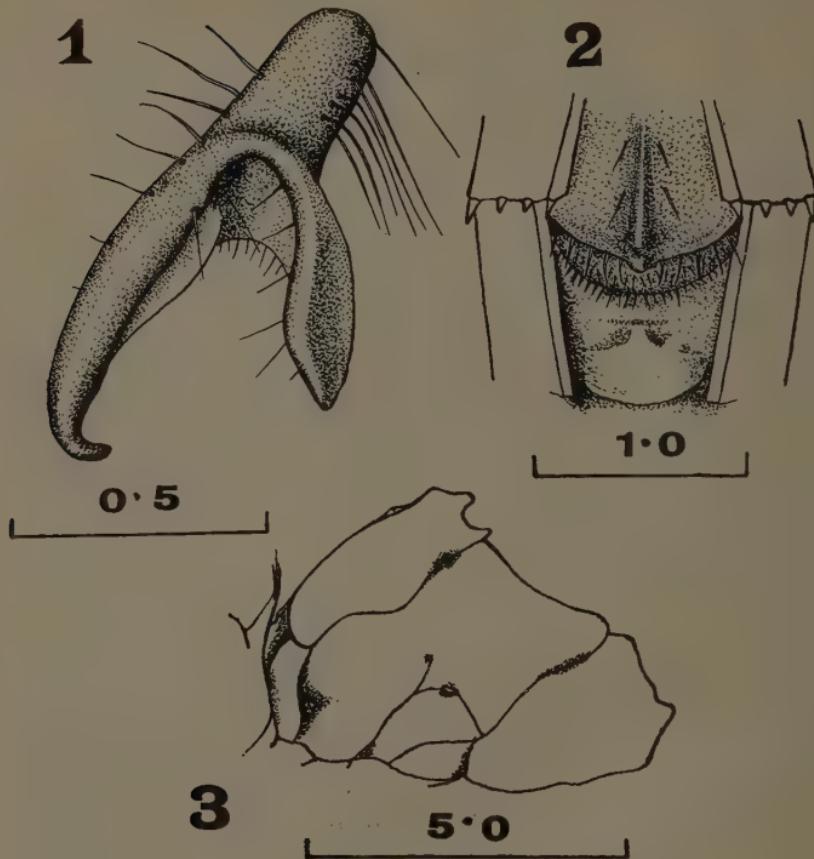
A third example can now be recorded, as I discovered a sub-teneral male taken at Dawlish, Devonshire, 1901, in the collection of the late Mr. H. J. Turner. This specimen was included in a small cabinet of British insects given to Mr. E. W. Classey by the late H. J. Turner's brother.

In size and colouration *meridionale* somewhat resembles our common *S. s. striolatum* (Charp.), except that the sides of the synthorax are nearly unicolorous (Fig. 3). Although the colouration is a useful field character, identification should be based on the examination of the genitalia. The male accessory genitalia is distinctive, the somewhat swollen, sharply hooked inner hamules and finger-like outer hamules provide easily determined characters (Fig. 1). The vulvar scale of the female (Fig. 2) has the distal margin convex in outline and lacks the central concavity of *striolatum*. Females of *S. sanguineum* (Müll.) have the vulvar scale resembling that of *meridionale* in outline, but the black legs and more pronounced lateral thoracic markings of the former species should, however, provide sufficient characters for these species to be separated in the field.

As it is feasible that *meridionale* has been overlooked in the past, any lightly marked *Sympetrum* should be closely examined, especially during a season when the immigrants *S. fonscolombei* (Selys) and *S. flaveolum* (L.) occur.

### ACKNOWLEDGMENTS

I am indebted to Miss C. Longfield for confirming my identification; to Dr. B. P. Moore for the loan of material; and to Mr. E. W. Classey for his generous gift of specimens.



*SYMPETRUM MERIDIONALE* (SELYS).

Figs. 1-3. (1) Right hamules of ♂ accessory genitalia. (2) Vulvar scale of ♀. (3) Lateral view of synthorax. (Measurements in millimetres.)

LITERATURE CONSULTED

**LONGFIELD, C.**, 1949. The Dragonflies (Odonata) of the London Area. *Lond. Nat. for 1948*: 80-98.

**LUCAS, W. J.**, 1900. *British Dragonflies*, London.

**RIS, F.**, 1911. Catalogue systematique et descriptif Collections Zoologiques du Baron Edm. de Selys Longchamps. *Libellulidae*. 5:529-700.

**SCHMIDT, E.**, 1929. Libellen, Odonata, in *Die Tierwelt Mitteleuropas*. 4:1-66.

NOTE ADDED IN PROOF. Dr. B. P. Moore has kindly pointed out a fourth record of *S. meridionale*. This, a male, was taken by the Rev. T. A. Marshall at Swanage (no date) and was identified by W. J. Lucas. See *Entomologist*, 1914, 47:96.

## BOOK REVIEW

*Mosquitoes of North America (North of Mexico)*, by Stanley J. Carpenter and Walter J. La Casse. University of California Press. 1955. 4to (11½in. x 8½in.), pp. vii, 360. 127 plates, 288 text figs. Cloth. Price £3 15s.

This is another book on Mosquitoes which will have a very wide appeal, but the publishers, who state that it is designed to meet the needs of (among others) 'field workers engaged in mosquito control', have overlooked a not unimportant point. Anyone who had been thus engaged could have told them that for a person so engaged a book size 11½in. x 8½in. was not a very welcome or comfortable companion. In any case, in home, laboratory or technical library, books of this size and shape are a nuisance, and it is surprising to find California University Press offending in this way. The illustrations are of great merit and the printing of great clarity, but why must the major headings be so self-consciously modern and crammed uncomfortably over to the extreme right-hand side of the text?

These criticisms are of the production of the book. Technically it appears excellent, but its contents are of such a nature that they must be mainly judged on the accuracy and facility of the Keys. Such a test is not the matter of a few days, or even a few weeks, and judgment will eventually be made only after constant use. In the treatment of its subject this book is reminiscent of Marshall, J. F. *British Mosquitoes*, and it is to be hoped that it will be as useful to the worker on the Culicidae of N. America as Marshall's book is to the Br'tish worker.

It is particularly gratifying to note the very low price at which the publishers have put this work on the market. Owing to the unfavourable exchange rate, books from the U.S.A. are necessarily expensive, but this book, with its great quantity of excellent illustrations, fine paper and printing, could probably have not been produced in this country to sell at so low a price.

E.W.C.

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RECENT RECORDS OF *SYMPETRUM NIGRESCENS* LUCAS  
(ODONATA: LIBELLULIDAE)

A male *S. nigrescens* was captured by Col. Niall MacNeill on 3rd September, 1955, on the Royal Canal, Blanchardstown, Co. Dublin. The species was common, and one male was taken by Mr. D. W. Tarry, at Glen Brittle, Isle of Skye, North Ebudes, during September, 1955. My best thanks are due to both gentlemen for sending me the specimens.

29 Glenfield Road,  
Banstead, Surrey.

A. E. GARDNER.

A CROSS-PAIRING OF *DILINA TILIAE* (L.) ♀  
AND *LAOTHOE POPULI* (L.) ♂  
(LEPIDOPTERA: SPHINGIDAE)

*Illustrated on Plate 3*

By W. J. AKESTER, F.R.P.S.

On 19th May last, I transferred a male *Laothoe populi* which had emerged during the evening of 18th May to a breeding cage which already contained two female *Dilina (Mimas) tiliae*, one male and one female *Smerinthus ocellatus* (L.), and one male and two female *L. populi*. The two female *D. tiliae* had emerged four days previously, while the remainder of the moths had emerged on the 17th or 18th.

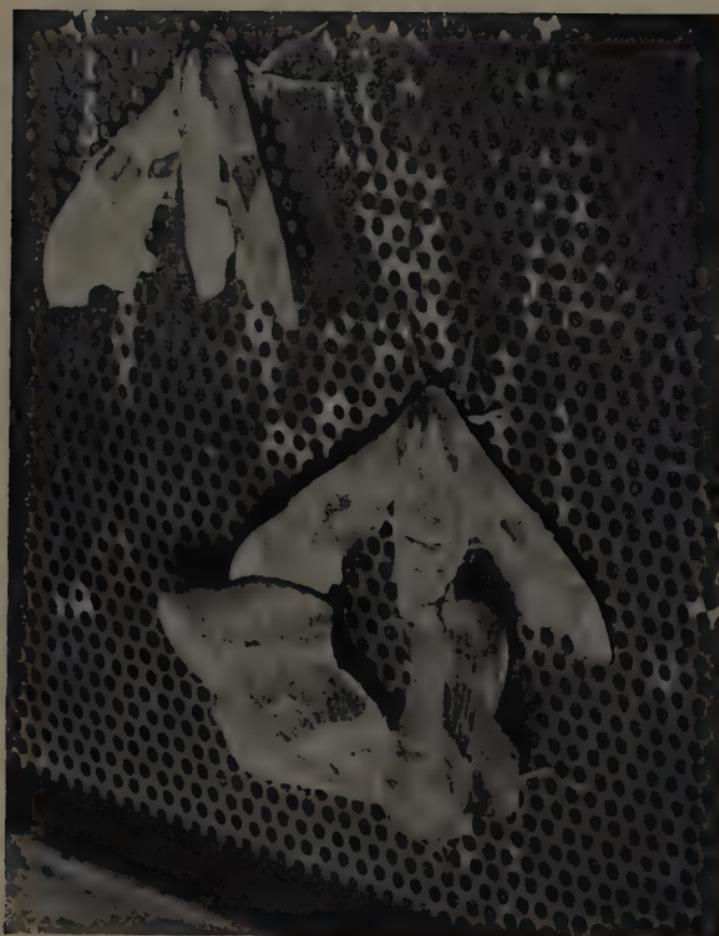
When the cage was inspected on the afternoon of 20th May, I found that three pairings had taken place; a normal *S. ocellatus*, a normal *L. populi*, and a pairing between the freshly introduced male *L. populi* and one of the female *D. tiliae*. The male was a large specimen and the female was rather small in size, and the pairing had taken place low down in the bottom corner of the cage in the place where the two females had been resting the previous evening. The two other pairings had taken place on the opposite side of the cage, and well to the top of it; the only moth at all close to the pair being the other *tiliae*. The male appeared to be very restive, and from time to time changed his position, so I decided to photograph the pair without delay, fearing that they would soon separate. The position of the pair made photography difficult, but four photographs were taken; two by means of flash, and two by photoflood. At about 6.30 p.m. the male became very restive and the couple separated.

When I examined the female I found that the male had caused considerable damage to her during the pairing, due no doubt to the large difference in their sizes, and in one place the body wall was compressed and a small rupture had occurred. I removed the female to another cage and the following day she appeared to be trying to oviposit, but seemed unable to although she made great efforts. No eggs were laid until the fourth day, when, after a tremendous effort, a single egg was deposited on the floor of the cage; after this she did not make many more attempts and died a few days later.

When the moth was dissected I found the abdomen full of eggs, but it was quite obvious that the damage caused by the male during pairing had made it almost impossible for an egg to pass through the oviduct.

The solitary egg caved in at the top after a few days, and it became obvious that it was infertile.

PLATE 3



Photograph by W. J. Akester, F.R.P.S.

Cross pairing of *D. tiliae* (L.) ♀ x *L. populi* (L.) ♂.



# SOME NOTES ON THE ECOLOGY OF THE AQUATIC AND SEMI-AQUATIC HEMIPTERA- HETEROPTERA AND THEIR ASSOCIATED FAUNA AND FLORA IN SOUTHERN HERTFORDSHIRE AND NORTH-EASTERN MIDDLESEX

By I. LANSBURY

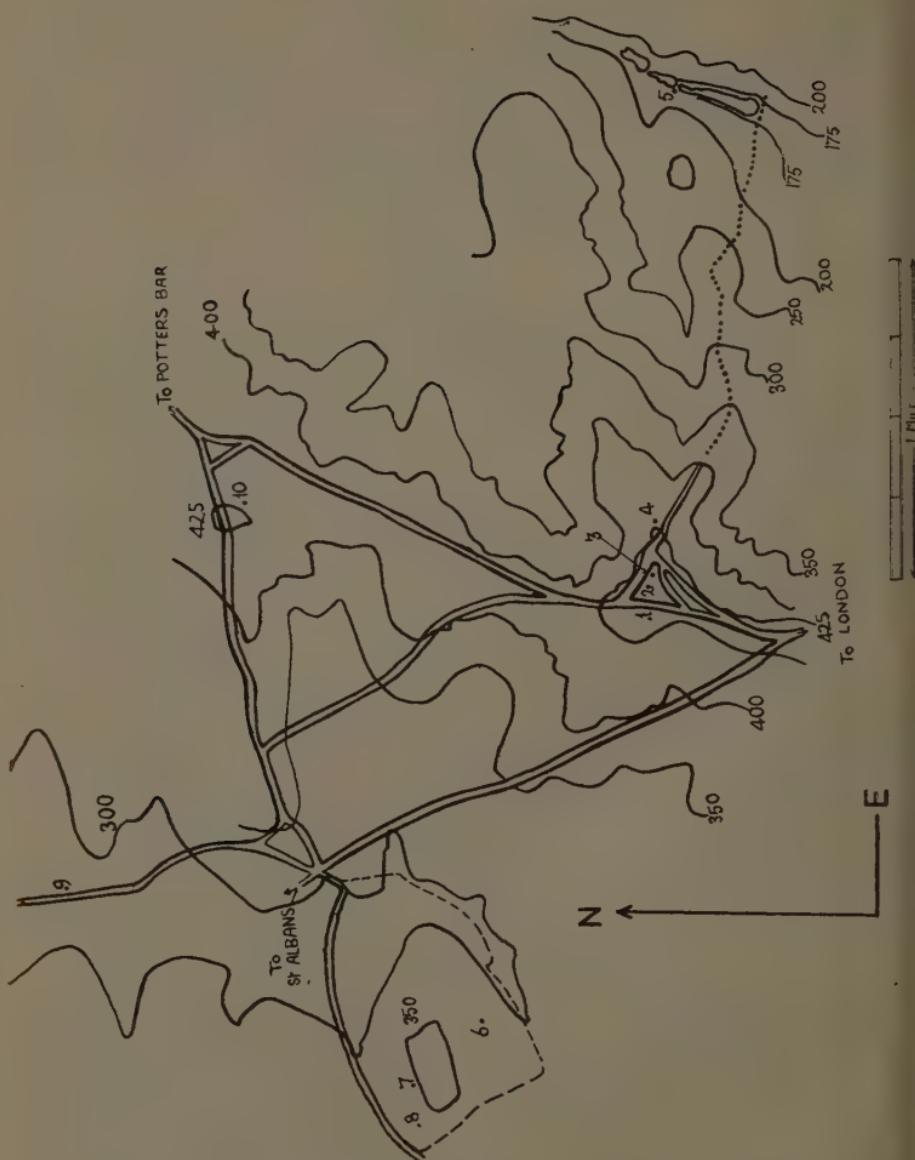
## *Introduction*

The object of this paper is to make a small contribution towards the ecological survey of the aquatic and semi-aquatic Hemiptera-Heteroptera of the British Isles, started by the Rev. E. J. Pearce and Dr. G. A. Walton in 1939. As in previous papers the associated fauna and flora are also recorded.

During 1953, the author made several collections from ten different habitats in southern Herts and north-eastern Middlesex, i.e. the area around Barnet. The terrain of this locality seems to be well suited to the formation of many ponds, lakes and streams, many of these have not yet been investigated. The basic geology of the area is mainly a substrate of London Clay; the hill on which Barnet is situated has a cap of gravel. Habitats 1, 2, 3 and 4 are all situated in this area at an altitude of about 400 feet; 5 is on the eastern side of Barnet at about 250 feet; 6, 7 and 8 are all situated on the edge of a slope and are about 300 feet above sea-level. 9 is the lowest at 260 feet, whilst 10 is the highest at 427 feet. Each habitat was visited at least six times. The following species, *Corixa dentipes*, *Sigara scotti*, *Cymatia coleoptera* and *Cy. bonsdorffi* were collected from Herts for the first time during this survey, Lansbury (1953).

*General Arrangement of the paper:* Section I is a detailed list of the Hemiptera recorded, giving details in most cases of the number of individuals, the sexes, the date and the habitat reference number; details of which can be found in Section II. In Section II a description of the habitat and location with a list of the Hemiptera and other organisms found in each, thus a complete cross-reference is available for the Hemiptera in Section I and II. Only the Hemiptera were systematically collected. Of the other orders of insects, Coleoptera were collected, but not systematically and the list of species is very incomplete. Section III is a discussion of individual species. Section IV is a discussion of the habitats generally and of the species occurring in each. Section V is a comparative list of the Hemiptera-Heteroptera recorded from the survey area and Herts generally.

*Identifications:* All the Hemiptera were identified by the author. Acknowledgments are extended to Dr. T. T. Macan and Mr. E. S. Brown for checking the determination of *Sigara scotti* (D. & S.).



Scale Map of the Survey area showing the position of the habitats and the general topography of the region.

Some of the Coleoptera were identified by Mr. D. J. Clark. The remainder of the organisms other than certain plants which were identified by Mr. Bangerter were identified by the author. Some of the Odonata were identified when adults; in other cases the nymphs were bred out.

*Explanation of the terms and abbreviations used in this paper:*

An 'open habitat' is defined as one in aqueous communication with another body of water of any description and receiving organic matter from external sources. A 'closed habitat' is one which appears to be completely isolated from other bodies of water and receiving no organic matter from external sources.

*Abbreviations:* ad = adult, macrop = macropterous, n = nymph, apt = apterous, brachyp = brachypterous.

Collecting technique, approximately half an hour was spent collecting at each habitat other than 1, where about fifteen minutes was devoted to each locus although not every locus was collected from on each visit.

*Nomenclature:* The nomenclature of the Coleoptera, is that used in Balfour-Browne's 'Water Beetles' (1949-1950); the Odonata, that in Longfield's 'The Dragonflies of the British Isles' (1949); the Trichoptera, Megaloptera and Plecoptera, that used in Kloet & Hinck's 'A Check List of British Insects'. The names used in the Hemiptera-Heteroptera have been adapted by the author from various sources. The nomenclature of the vertebrates follows the British Museum (Natural History) 'A List of British Vertebrates' (1935); and the plants that in Clapham, Tutin and Warburg's 'Flora of the British Isles' (1952).

## SECTION I

### LIST OF THE SPECIES RECORDED

#### MESOVELIIDAE

*Mesovelia furcata* Mulsant and Rey: 1. 25.viii.53, Loc. C. 1 n: 2. 25.ix.53, ad ab: 10. 20.ix.53, 20 ad; 11.x.53, 1 ad.

#### HYDROMETRIDAE

*Hydrometra stagnorum* (L.): 5. 25.ix.53, 9♂, 6♀; 29.x.53, 1♂: 9. 8.v.54, 1♂, 1♀; 13.v.54, 3♂.

#### VELIIDAE

*Velia catrai* Tamanini: 9. 23.iv.54, 4 n; 8.v.54, 1♀.

*Microvelia reticulata* (Burmeister): 4. 25.viii.53, 2♂, 1♀; 25.viii.53, 24 ad: 5. 25.viii.53, 1♀; 25.ix.53, 3♂, 2♀; 29.x.53; 2♀: 6. 20.ix.53, 9 ad: 10. 20.ix.53, 10 ad.

#### GERRIDAE

*Gerris thoracicus* Schummel: 2. 26.iii.53, 1♂: 5. 26.iii.53, 1♀: 9. 8.v.54, 1♂, 2♀.

*Gerris lacustris* (L.): **1.** 6.v.53, Loc. B. 1♂: **2.** 6.v.53, 5♂, 4♀; 25.ix.53, 6♂, 10♀; 29.x.53, 2♀: **3.** 6.v.53, 12♂, 3♀; 25.viii.53, 9♂, 7♀; 25.ix.53, 8♂, 2♀; 29.x.53, 8♂, 8♀; 22.xi.53, 1♀: **4.** 25.viii.53, 2♂; 25.ix.53, 5♂, 4♀: **5.** 26.iii.53, 2♂; 23.iv.53, 2♀; 25.viii.53, 3♂, 3♀; 25.ix.53, 5♂, 4♀; 29.x.53, 4♂; **6.** 17.v.53, 2♂, 1♀; 20.ix.53, 1♀: **8.** 17.v.53, 1♂, 1♀: **9.** 20.ix.53, 4♂, 3♀; 11.x.53, 7♂, 2♀; 8.v.54, 3♂, 3♀; 13.v.54, 12♂, 6♀.

*Gerris odontogaster* (Zetterstedt): **1.** 26.iv.53, Loc. B. 1♂: **2.** 23.iv.53, 6♂, 7♀; 6.v.53, 2♂, 4♂; 25.ix.53, 3♂, 2♀; **3.** 6.v.53, 2♂, 1♀; **4.** 25.viii.53, 1♀; 25.ix.53, 6♂, 5♀: **5.** 25.viii.53, 1♂, 2♀; 25.ix.53, 3♂, 3♀: **6.** 20.ix.53, 6♂, 5♀: **10.** 11.x.53, 1♂: **9.** 8.v.53, 2♂, 3♀; 8.v.54, 1♀.

*Gerris gibbifera* Schummel: **3.** 6.v.53, 1♂.

## NEPIDAE

*Nepa cinerea* L.: **1.** 6.v.53, Loc. F. 1 ad; 25.viii.53, Loc. C. 4 n; 15.xi.53, Loc. F. 1 ad: **2.** 23.iv.53, 1 ad; 25.ix.53, 1 ad: **4.** 22.ii.53, 1 ad; 6.v.53, 1 ad; 25.ix.53, 1 ad, 1 n: **5.** 8.iii.53, 1 ad; 25.viii.53, 1 ad; 25.ix.53, 1 ad, 1 n: **9.** 13.v.54, 1♂, 1♀.

*Ranatra linearis* (L.): **2.** 23.iv.53, 1 ad: **10.** 19.iv.53, 1 ad; 20.ix.53, 3 ad.

## PLEIDAE

*Plea leachi* MacGregor: **4.** 26.iii.53, 24 ad; 25.viii.53, 1 n; 25.ix.53, 11 ad: **10.** 20.ix.53, ad abundant.

## NOTONECTIDAE

*Notonecta glauca* L.: **1.** 27.i.53, Loc. B. 1♂, 1♀; 22.ii.53, Loc. B. 1♂, 1♀; 9.iii.53, Loc. B. 1♂; 26.iv.53, Loc. C. 2♂, 2♀; 6.v.53, Loc. B. 1♂, 1♀; 25.ix.53, Loc. C. 2♂; 29.x.53, Loc. C. 1♀, Loc. B. 2♀; 15.xi.53, Loc. B. 3♀: **2.** 27.i.53, 2♀; 22.ii.53, 1♀; 26.iii.53, 2♂; 23.iv.53, 1♂, 1♀; 6.v.53, 1♀; 25.ix.53, 1♀; 29.x.53, 5♂, 1♀; 13.xii.53, 1♂, 1♀: **3.** 27.i.53, 3♂; 22.ii.53, 1♂; 6.v.53, 1♂, 1♀; 25.ix.53, 2♂; 29.x.53, 1♀; 22.xi.53, 4♂, 4♀; 13.xii.53, 1♂: **4.** 28.i.53, 2♂, 1♀; 22.ii.53, 2♀; 9.iii.53, 1♂; 26.iii.53, 7♂, 5♀; 25.viii.53, 1♂, 1♀; 25.ix.53, 2♂, 1♀; 22.xi.53, 1♂, 1♀: **5.** 28.i.53, 2♀; 8.iii.53, 1♂; 25.viii.53, 5♂, 1♀; 25.ix.53, 1♂, 29.x.53, 2♂, 4♀; 6.xii.53, 1♀: **6.** 18.i.53, 5♂, 7♀; 19.iv.53, 1♂, 4♀; 17.v.53, 1♂, 3♀; 20.ix.53, 12♂, 3♀; 11.x.53, 9♂, 5♀; 29.xi.53, 5♂, 3♀; 13.xii.53, 4♂, 1♀: **7.** 22.iii.53, 1♂, 1♀; 10.v.53, 1♂; 20.ix.53, 1♂, 3♀; 29.xi.53, 1♀; 13.xii.53, 1♀: **8.** 20.iv.53, 1♀; 29.xi.53, 1♀: **9.** 29.iii.53, 1♂, 3♀; 3.iv.53, 1♂, 4♀; 8.v.53, 3♀; 19.v.53, 1♀; 20.ix.53, 9♂, 4♀; 11.x.53, 6♂, 2♀; 29.xi.53, 2♂, 1♀; 20.xii.53, 1♂, 1♀: **10.** 22.ii.53, 2♂, 2♀; 8.iii.53, 3♂, 6♀; 19.iv.53, 2♂, 1♀; 4.v.53, 4♀; 22.xi.53, 1♀.

*Notonecta obliqua* Gallen: **1.** 27.i.53, Loc. B. 2♂, 1♀; Loc. C. 2♂, 4♀; 22.ii.53, Loc. C. 5♂, 2♀; 9.iii.53, Loc. B. 2♂, 2♀, Loc. C. 2♂, 3♀; 26.iv.53, Loc. C. 4♂, 1♀; 6.v.53, Loc. B. 1♂; Loc. F.

1♂, 2♀; 25.viii.53, Loc. A. 1♂, Loc. C. 10♂, 11♀; 25.ix.53, Loc. A. 2♀, Loc. C. 10♂, 1♀, Loc. E. 5♂, 5♀, Loc. F. 5♂, 5♀; 29.x.53, Loc. B. 7♂, 4♀, Loc. C. 3♂, 1♀; 15.xi.53, Loc. B. 4♂, 5♀, Loc. C. 2♀, Loc. F. 3♂, 1♀; 13.xii.53, Loc. B. 5♂, 3♀, Loc. C. 1♂, 1♀: **2.** 11.i.53, 1♀; 27.i.53, 2♂, 1♀; 22.ii.53, 1♂; 29.x.53, 2♀; 13.xii.53, 2♂, 2♀: **3.** 22.ii.53, 1♀; 6.v.53, 1♂; 25.ix.53, 1♂; 29.x.53, 3♀; 22.xi.53, 1♂: **4.** 28.i.53, 1♂; 9.iii.53, 1♀; 26.iii.53, 1♀; 25.viii.53, 1♀; 25.ix.53, 2♂: **10.** 22.ii.53, 2♀; 8.iii.53, 3♀; 11.x.53, 1♂; 22.xi.53, 1♂, 1♀.

*Notonecta viridis* Delcourt: **1.** 22.ii.53, Loc. B. 1♂, 1♀; 9.iii.53, Loc. C. 3♂, 2♀; 26.iv.53, Loc. B. 3♂; 6.v.53, Loc. C. 1♂, 1♀; 25.viii.53, Loc. A. 2♂, Loc. C. 2♂, 3♀; 25.ix.53, Loc. C. 1♂; 29.x.53, Loc. B. 1♂, Loc. C. 1♂, 1♀; 15.xi.53, Loc. B. 3♀; 13.xii.53, Loc. B. 5♂, 2♀: **2.** 27.i.53, 2♀; 22.xi.53, 1♂; 13.xii.53, 1♂: **3.** 27.i.53, 1♀; 25.ix.53, 1♂; 22.xi.53, 1♂, 1♀: **4.** 22.ii.53, 1♂, 1♀; **5.** 25.ix.53, 1♂: **6.** 20.ix.53, 1♂: **7.** 29.xi.53, 1♂, 1♀: **9.** 20.ix.53, 1♂; 11.x.53, 1♀; 29.xi.53, 1♀: **10.** 11.x.53, 1♂; 22.xi.53, 1♀.

*Notonecta maculata* Fabricius: **3.** 25.viii.53, 1♀; 29.x.53, 1♀.

## NAUCORIDAE

*Naucoris cimicoides* (L.): **1.** 26.iv.53, Loc. C. 1 ad; 25.viii.53, Loc. C. 1 n: **2.** 26.iii.53, 3 ad; 23.iv.53, 2 ad; 6.v.53, 3 ad; 25.ix.53, 1 ad; 29.x.53, 6 ad; 13.xii.53, 7 ad: **3.** 25.viii.53, 1 n; 25.ix.53, 1 ad: **4.** 28.i.53, 3 ad; 22.ii.53, 3 ad; 9.iii.53, 5 ad; 26.iii.53, 11 ad; 6.v.53, 1 ad; 25.ix.53, 2 ad; 22.xi.53, 3 ad: **6.** 18.i.53, 2 ad; 17.v.53, 1 ad; 20.ix.53, 2 ad, 1 n; 11.x.53, 3 ad: **7.** 19.iv.53, 2 ad; 10.v.53, 1 ad; 17.v.53, 1 ad; 20.ix.53, 2 ad: **9.** 19.v.53, 1 ad; 20.ix.53, 1 ad 1 n; 11.x.53, 2 ad: **10.** 19.iv.53, 1 ad; 4.v.53, 1 ad; 11.x.53, 2 ad.

## CORIXIDAE

*Cymatia bonsdorffi* (C. Sahlberg): **1.** 6.v.53, Loc. A. 1♀: **4.** 6.v.53, 1♀.

*Cymatia coleoptrata* (Fabricius): **7.** 18.i.53, 3♂, 1♀; 25.i.53, 2♂ 2♀; 22.iii.53, 3♂, 2♀; 19.iv.53, 11♂, 16♀; 10.v.53, 1♂; 17.v.53, 4♂, 4♀; 20.ix.53, 14♂, 8♀; 11.x.53, 8♂, 3♀; 29.xi.53, 16♂, 15♀; 13.xii.53, 1♂, 2♀.

*Corixa punctata* (Illiger): **1.** 9.iii.53, Loc. B. 9♀; 6.v.53, Loc. B. 5♀; 25.viii.53, Loc. C. 5♂, 10♀; 25.ix.53, Loc. C. 3♂, 2♀; Loc. E. 2♂, 1♀; Loc. F. 1♂, 1♀; 29.x.53, Loc. C. 1♂, 5♀; 15.xi.53, Loc. F. 1♂, 1♀; 13.xii.53, Loc. B. 3♀: **2.** 9.iii.53, 1♀; 26.iii.53, 5♀; 29.x.53, 2♀: **3.** 27.i.53, 2♂; 22.ii.53, 1♂, 1♀; 25.ix.53, 2♂, 1♀; 29.x.53, 1♀; 22.xi.53, 2♀; 13.xii.53, 1♀: **4.** 28.i.53, 1♂, 2♀; 22.ii.53, 5♂, 9♀; 9.iii.53, 2♂, 1♀; 26.iii.53, 2♂, 5♀; 25.viii.53, 1♀; 25.ix.53, 8♂, 2♀; 22.xi.53, 9♂, 15♀; 13.xii.53, 1♂: **6.** 18.i.53, 1♂, 2♀; 19.iv.53, 3♂, 2♀; 17.v.53, 3♂, 1♀; 20.ix.53, 2♀; 11.x.53, 1♀; 29.xi.53, 1♂; 13.xii.53, 1♀: **7.** 22.ii.53, 1♂, 5♀; 19.iv.53,

1♀; 29.xi.53, 2♂: **8.** 22.iii.53, 1♀; 29.xi.53, 1♀: **9.** 29.iii.53, 3♀; 8.v.53, 4♀; 20.ix.53, 1♂, 1♀; 11.x.53, 1♂: **10.** 22.ii.53, 3♀; 8.iii.53, 1♀; 13.v.53, 1♀; 20.ix.53, 3♂, 6♀; 11.x.53, 9♂, 7♀; 22.xi.53, 1♂, 3♀; 13.xii.53, 1♂.

*Corixa dentipes* (Thomson): **4.** 22.xi.53, 3♂, 1♀; 26.xi.53, 2♂, 8♀.

*Sigara dorsalis* Leach (= *lacustris* Macan): **1.** 9.iii.53, Loc. A. 1♂, 1♀; 6.v.53, Loc. A. 3♂, 9♀; 25.ix.53, Loc. F. 23♂, 28♀; 25.xi.53, Loc. F. 21♂, 10♀: **2.** 11.i.53, 1♂, 4♀; 27.i.53, 3♂, 2♀; 22.ii.53, 1♂; 23.iv.53, 1♂; 25.ix.53, 3♂, 2♀; 29.x.53, 1♂; 29.xi.53, 1♂, 2♀; 13.xii.53, 1♂: **3.** 27.i.53, 2♂, 3♀; 22.ii.53, 5♂, 7♀; 9.iii.53, 2♂, 1♀; 6.v.53, 4♂, 12♀; 25.viii.53, 12♂, 10♀; 25.ix.53, 37♂, 47♀; 29.x.53, 7♂, 5♀; 22.xi.53, 31♂, 24♀; 13.xii.53, 4♂, 3♀: **4.** 22.ii.53, 3♀; 26.iii.53, 2♂, 7♀; 25.ix.53, 3♂, 5♀; 22.xi.53, 12♂, 21♀: **5.** 28.i.53, 3♂, 8♀; 15.ii.53, 9♂, 4♀; 8.iii.53, 1♂; 26.iii.53, 1♂, 1♀; 25.ix.53, 3♂; 29.x.53, 1♂; 6.xii.53, 2♂, 3♀: **6.** 18.i.53, 5♂, 6♀; 22.iii.53, 1♂; 17.v.53, 1♀; 11.x.53, 3♂, 2♀: **7.** 22.iii.53, 1♂, 3♀; 29.xi.53, 15♂, 11♀: **9.** 29.iii.53, 59♂, 120♀; 3.iv.53, 30♂, 57♀; 8.v.53, 29♂, 62♀; 19.v.53, 4♂, 11♀; 20.ix.53, 11♂, 13♀; 29.xi.53, 11♂, 12♀; 20.xii.53, 2♀; 10.i.54, 7♂, 3♀; **10.** 22.ii.53, 1♂; 19.iv.53, 2♂, 4♀ 22.ix.53, 19♂, 20♀; 13.xii.53, 1♀.

*Sigara limitata* (Fieber): **1.** 27.i.53, Loc. A. 2♂, 10♀; 22.ii.53, Loc. A. 14♂, 16♀; 9.iii.53, Loc. A. 66♂, 74♀; 26.iv.53, Loc. A. 13♂, 64♀; 6.v.53, Loc. A. 7♂, 56♀, Loc. F. 5♂, 11♀; 25.viii.53, Loc. A. 28♂, 61♀, Loc. C. 16♂, 24♀; 25.ix.53, Loc. A. 27♂, 34♀, Loc. C. 15♂, 15♀, Loc. E. 2♂; 29.x.53, Loc. A. 14♂, 22♀, Loc. B. 6♂, 5♀, Loc. C. 23♂, 21♀; 15.xi.53, Loc. A. 30♂, 23♀, Loc. B. 10♂, 18♀, Loc. C. 1♂; 15.xii.53, Loc. A. 15♂, 8♀, Loc. B. 4♂, 10♀, Loc. C. 8♂, 8♀: **3.** 29.x.53, 1♂, 1♀: **4.** 25.viii.53, 1♂; 25.ix.53, 2♀; 22.xi.53, 1♂, 1♀: **9.** 8.v.53, 1♀: **10.** 22.ii.53, 22♂, 3♀; 8.iii.53, 8♂, 2♀; 19.iv.53, 8♂, 20♀; 4.v.53, 6♂, 16♀; 13.v.53, 10♀; 20.ix.53, 33♂, 45♀; 11.x.53, 21♂, 18♀; 22.xi.53, 11♂, 20♀; 13.xii.53, 9♂, 4♀.

*Sigara nigrolineata* Fieber: 27.i.53, Loc. A. 13♂, 6♀; 22.ii.53, Loc. A. 7♂, 10♀; 9.iii.53, Loc. A. 20♂ 21♀; 26.iv.53, 9♂, 42♀; 6.v.53, Loc. A. 5♂, 27♀; 25.viii.53, Loc. A. 1♂, 4♀; 25.ix.53, Loc. A. 3♂, 17♀, Loc. F. 7♂, 13♀; 29.x.53, Loc. A. 21♂, 32♀, Loc. B. 3♀, Loc. C. 5♀; 15.xi.53, Loc. A. 34♂, 36♀, Loc. B. 3♂, 4♀, Loc. F. 4♂, 15♀; 13.xii.53, Loc. A. 21♂, 19♀, Loc. B. 1♂, Loc. C. 1♀: **8.** 11.x.53, 1♂: **9.** 29.iii.53, 3♀; 11.x.53, 1♂, 1♀; 29.xi.53, 2♂, 2♂: **10.** 4.v.53, 2♂, 1♀; 11.x.53, 1♀.

*Sigara scotti* Douglas and Scott (Fieber): **1.** 9.iii.53, Loc. A. 13♂, 18♀; 26.iv.53, Loc. A. 14♂, 18♀; 6.v.53, Loc. A. 9♂, 24♀, Loc. F. 9♂, 23♀; 25.viii.53, Loc. A. 17♂, 17♀, Loc. C. 14♂, 13♀; 25.ix.53, Loc. A. 15♂, 16♀, Loc. C. 11♂, 10♀, Loc. E. 4♂, 9♀, Loc. F. 18♂, 41♀; 29.x.53, Loc. A. 6♂, 6♀, Loc. B. 16♂, 16♀, Loc. C.

28♂, 21♀; 15.xi.53, Loc. A. 19♂, 12♀, Loc. B. 20♂, 26♀, Loc. C. 9♂, 11♀, Loc. F. 17♂, 17♀; 13.xii.53, Loc. A. 13♂, 9♀, Loc. B. 13♂, 12♀, Loc. C. 13♂, 15♀: **3.** 22.xi.53, 1♂, 2♀.

*Sigara fossarum* Leach: **1.** 22.ii.53, Loc. B. 3♂, 5♀; 9.iii.53, Loc. B. 2♂; 25.iv.53, Loc. B. 3♂; 6.v.53, Loc. A. 2♂, 1♀; 25.viii.53, Loc. A. 3♂, 1♀; 25.ix.53, Loc. E. 10♂, 13♀, Loc. F. 3♂, 1♀; 15.xi.53, Loc. B. 12♂, 21♀; 13.xii.53, Loc. B. 1♂, 2♀: **4.** 28.i.53, 2♀; 26.iii.53, 4♂, 3♀; 6.v.53, 3♂; 25.ix.53, 2♂, 2♀; 25.xi.53, 8♂, 1♀: **5.** 15.ii.53, 1♂: **6.** 18.i.53, 2♂, 6♀; 19.iv.53, 1♂, 1♀; 17.v.53, 1♂, 2♀; 20.ix.53, 3♂; 11.x.53, 19♂, 20♀; 29.xi.53, 1♀: **10.** 4.v.53, 1♂.

*Sigara falleni* (Fieber): **1.** 9.iii.53, Loc. A. 3♂; 6.v.53, Loc. F. 1♂, 3♀; 25.ix.53, Loc. E. 3♂, 5♀; 15.xi.53, Loc. B. 4♂; 13.xii.53, Loc. B. 1♂, 1♀: **2.** 11.i.53, 1♂; 27.i.53, 2♀; 23.iv.53, 1♀: **3.** 27.i.53, 1♂; 22.xi.53, 2♂: **4.** 25.ix.53, 4♂, 10♀; 22.xi.53, 7♂, 6♀: **5.** 28.i.53, 1♀; 15.ii.53, 1♂, 4♀; 8.iii.53, 1♂; 25.viii.53, 1♂, 2♀; 25.ix.53, 1♀; 29.x.53, 1♂: **6.** 18.i.53, 3♂, 6♀; 11.x.53, 1♂: **9.** 10.i.54, 1♂: **10.** 22.ii.53, 2♀; 8.iii.53, 1♂; 19.iv.53, 2♂, 6♀; 4.v.53, 20♂, 30♀; 13.v.53, 16♂, 13♀; 20.ix.53, 1♂; 11.x.53, 2♂; 22.xi.53, 11♂, 14♀; 13.xii.53, 1♂.

*Sigara distincta* (Fieber): **1.** 27.i.53, Loc. A. 1♂; 9.iii.53, 11♂, 13♀; 26.iv.53, Loc. A. 1♀; 6.v.53, Loc. A. 2♂, 2♀, Loc. F. 19♂, 10♀; 25.viii.53, Loc. A. 1♂, 2♀, Loc. C. 1♂; 25.ix.53, Loc. A. 2♂, 2♀, Loc. E. 28♂, 21♀, Loc. F. 31♂, 46♀; 29.x.53, Loc. A. 2♂, 1♀, Loc. B. 9♂, 5♀, Loc. C. 1♀; 15.xi.53, Loc. A. 1♂, 3♀, Loc. B. 7♂, 5♀, Loc. C. 1♂, 1♀, Loc. F. 20♂, 23♀; 13.xii.53, Loc. B. 1♂, 2♀: **2.** 22.xi.53, 1♂, 1♀: **3.** 6.v.53, 1♀: **4.** 28.i.53, 1♀; 26.iii.53, 2♂, 2♀; 6.v.53, 1♂, 1♀; 25.ix.53, 2♂; 22.xi.53, 8♂, 8♀: **5.** 25.viii.53, 1♂: **6.** 18.i.53, 6♂, 2♀; 19.iv.53, 1♂, 3♀; 17.v.53, 1♂, 1♀; 11.x.53, 3♂, 2♀; 29.xi.53, 1♂: **10.** 22.ii.53, 2♀; 19.iv.53, 2♂, 4♀; 4.v.53, 4♂, 14♀; 13.v.53, 6♂, 9♀; 11.x.53, 2♂; 22.xi.53, 11♂, 20♀.

*Sigara lateralis* Leach: **1.** 6.v.53, Loc. A. 1♂; 29.x.53, Loc. C. 3♂; 15.xi.53, Loc. A. 1♂, 2♀; 13.xii.53, Loc. A. 1♂, 2♀: **3.** 6.v.53, 1♀: **4.** 22.ii.53, 1♀; 26.iii.53, 1♂; 22.xi.53, 2♀: **7.** 22.iii.53, 2♂, 1♀; 19.iv.53, 1♂, 3♀: **9.** 29.iii.53, 1♀: **10.** 22.ii.53, 11♂, 10♀; 8.iii.53, 1♂; 19.iv.53, 5♂, 4♀; 4.v.53, 10♂, 10♀; 13.v.53, 8♂, 7♀; 20.ix.53, 8♂, 6♀; 22.xi.53, 4♂, 6♀; 13.xii.53, 10♂, 15♀.

*Sigara concinna* (Fieber): **9.** 21.iii.54, 1♂: **10.** 11.x.53, 1♀.

*Hesperocorixa moesta* (Fieber): **1.** 22.ii.53, Loc. A. 2♂, 1♀; 9.iii.53, Loc. B. 1♀; 25.viii.53, Loc. C. 2♂, 4♀; 25.ix.53, Loc. C. 5♂, 3♀; 29.x.53, Loc. C. 1♂, 6♀; 15.xi.53, Loc. C. 1♀; 6.xii.53, Loc. D. 11♂, 18♀: **4.** 13.xii.53, 1♀: **5.** 25.ix.53, 1♀: **6.** 18.i.53, 1♂; 11.x.53, 1♀: **10.** 2♂, 2♀; 8.iii.53, 2♂; 19.iv.53, 2♀; 20.ix.53, 5♀; 16.x.53, 1♂; 13.xii.53, 1♀.

*Hesperocorixa linnei* (Fieber): **1.** 27.i.53, Loc. A. 1♀; 22.ii.53, Loc. B. 1♂; 9.iii.53, Loc. C. 1♀; 26.iv.53, Loc. C. 1♂; 25.viii.53,

Loc. C. 1♀; 25.ix.53, Loc. C. 1♂: 3. 27.i.53, 1♂, 2♀; 22.ii.53, 1♀; 6.v.53, 1♂, 1♀; 22.xi.53, 1♂: 4. 26.iii.53, 1♂, 2♀; 25.ix.53, 2♂; 22.xi.53, 1♀: 5. 28.i.53, 2♂, 3♀; 15.ii.53, 1♀; 26.iii.53, 1♂: 6. 18.i.53, 86♂, 92♀; 22.iii.53, 15♂, 7♀; 19.iv.53, 4♂, 5♀; 17.v.53, 5♂, 2♀; 20.ix.53, 6♂, 7♀; 11.x.53, 23♂, 27♀; 29.xi.53, 13♂, 9♀; 13.xii.53, 3♂, 3♀: 7. 22.iii.53, 1♂; 19.iv.53, 1♂; 20.ix.53, 3♂; 11.x.53, 2♂; 29.xi.53, 5♂, 2♀: 10. 22.ii.53, 1♀; 8.iii.53, 1♀; 22.xi.53, 5♂, 4♀; 13.xii.53, 2♂, 4♀.

*Hesperocorixa sahlbergi* (Fieber): 1. 9.iii.53, Loc. C. 1♂, 2♀; 13.xii.53, Loc. C. 2♀: 2. 22.xi.53, 1♀: 3. 27.i.53, 1♀; 22.xi.53, 2♂, 2♀: 5. 28.i.53, 12♂, 9♀; 15.ii.53, 3♂, 3♀; 25.viii.53, 1♂; 25.ix.53, 3♂, 3♀; 6.xii.53, 1♂: 6. 8.i.53, 5♂, 12♀; 22.iii.53, 4♂, 1♀; 19.iv.53, 4♂, 3♀; 17.v.53, 1♀; 20.ix.53, 2♂, 1♀; 11.x.53, 9♂, 14♀; 29.xi.53, 54♂, 43♀: 8. 22.iii.53, 1♂, 4♀; 17.v.53, 6♂, 11♀; 20.ix.53, 15♂, 10♀; 11.x.53, 2♂, 3♀; 29.xi.53, 3♀; 20.xii.53, 1♂, 4♀: 9. 29.iii.53, 1♀; 8.v.53, 1♂; 19.v.53, 1♀; 20.ix.53, 3♂, 2♀; 29.xi.53, 1♀; 20.xii.53, 2♂, 1♀; 10.i.54, 3♂, 2♀: 10. 8.iii.53, 1♂; 22.xi.53, 1♀; 13.xii.53, 1♀.

*Callicorixa praeusta* (Fieber): 1. 9.iii.53, Loc. A. 1♂; 29.x.53, Loc. C. 2♂, 1♀: 2. 25.ix.53, 1♂: 3. 22.ii.53, 1♀; 6.v.53, 1♂; 25.ix.53, 1♂, 2♀; 22.xi.53, 2♂, 4♀: 5. 28.i.53, 1♂: 6. 11.x.53, 1♂, 2♀: 7. 22.iii.53, 1♂, 1♀; 11.x.53, 1♂: 10. 8.iii.53, 2♂; 22.xi.53, 1♂.

*Micronecta scholtzi* Scholtz: 5. 25.viii.53, 1♀; 25.ix.53, 1♂; 29.x.53, 1 n; 20.iv.54, 5♂, 3♀, 1 n.

## SECTION II

### *List and descriptions of habitats*

#### **Hertfordshire**

*Habitat No. 1.* A moderately large pond on Hadley Green, Nat. Grid Ref. No. 51/245.75-974.5. This was an open habitat and had several ditches draining into it. The depth was variable, from two or three inches to a foot at the margins, in the centre unknown. A small island had been built by the local authorities in the eastern half. The bottom was mainly fine gravel, with a covering of detritus in places. The pH was variable, from 4.5 to 7.

This pond divided naturally into several loci, details as follows:—

Locus A. shallow area on southern side, single Scots pine overhung the edge, bottom fine gravel with silty detritus, no vegetation other than algae on the bottom.

Locus B. shallow grassy bank (*Glyceria*) on western side.

Locus C. shallow area on northern side, wind blown detritus, submerged vegetation (*Drepanocladus fluitans*).

Locus *D*. shallow area on eastern side, bottom lined with dead leaves (Sycamore).

Locus *E*. moderately deep water about the island (twelve-eighteen inches), greatest area of emergent vegetation, particularly *Alisma* and *Glyceria*.

Locus *F*. the centre of the pond, where there did not appear to be any vegetation.

#### Fauna:

**Coleoptera:** *Dytiscus marginalis* L., *Ilybius fenestratus* (Fabr.), *Rantus exsoletus* (Forst.), *R. pulverosus* (Steph.), *R. bistriatus* (Berg.), *Copelatus agilis* (Fabr.), *Colymbetes fuscus* (L.), *Noterus capricornis* (Herbert), *Hyphydrus ovatus* (L.), *Agabus sturmii* (Gyll.), *A. chalconatus* (Panz.), *A. bipustulatus* (L.), *Hygrobia hermannii* (Fabr.), *Haliplus* sp. **Odonata:** *Aeshna* sp., *Anax imperator* Leach, *Libellula depressa* L., *Pyrrhosoma nymphula* (Sulz.), *Ischnura elegans* (Van der Lind.), *Coenagrion puella* (L.). **Trichoptera:** *Phryganea* sp., *Limnephilus vittatus* (Fabr.), *Glyphotaelius pellucidus* (Retz.), *Polycentropus flavomaculatus* (Pictet). **Hemiptera:** *Corixa punctata* (Illiger), *Sigara dorsalis* Leach, *S. distincta* (Fieb.), *S. falleni* (Fieb.), *S. scotti* (Fieb.), *S. fossarum* Leach, *S. lateralis* Leach, *S. nigrolineata* (Fieb.), *S. limitata* (Fieb.), *Hesperocorixa moesta* (Fieb.), *H. sahlbergi* (Fieb.), *H. limei* (Fieb.), *Callicorixa praeusta* (Fieb.), *Cymatia bonsdorffii* (Sahlberg, C.), *Notonecta obliqua* Gallen, *N. viridis* Delcourt, *N. glauca* L., *Ilyocoris cimicoides* (L.), *Nepa cinerea* L., *Gerris lacustris* (L.), *G. odontogaster* (Zett.). **Vertebrates:** *Gasterosteus aculeatus* L., *Cyprinus carpio* L., *Triturus vulgaris* L.).

#### Flora:

*Glyceria declinata* Brebisson, *G. fluitans* (L.), *Alopecurus geniculatus* L., *Alisma plantago-aquatica* L. *Agrostis stolonifera* L., *Ag. sp.*, *Juncus effusus* L., *J. articulatus* L., *Apium inundatum* (L.), *Ceratopyllum* sp., *Drepanocladus fluitans* (Hedw.).

**Habitat No. 2.** A slightly larger pond than No. 1, on Hadley Green; Nat. Grid Ref. No. 51/247.5-974. The average depth around the margins was about nine to twelve inches, in the centre unknown. This habitat sometimes had water draining into it from a ditch on the Green, especially during the winter. The bottom was mainly coarse gravel, with much detritus, consisting mainly of branches and twigs from a willow tree which overhung one corner; immediately under this tree there was a thick deposit of black ooze of willow leaves.

#### Fauna:

**Coleoptera:** *Dytiscus marginalis*, *Pelobius hermanni* (Fabr.), *Hyphydrus ovatus*, *Haliplus laminatus* (Schall.), *H. immaculatus* (Gerh.), *H. lineatocollis* Marsham, *Noterus capricornis*. **Ephemero-**

**tera:** *Clöen* sp. **Trichoptera:** *Phryganea* sp., *Limnephilus* sp. **Hemiptera:** *Corixa punctata*, *Sigara dorsalis*, *S. falleni*, *S. distincta*, *Hesperocorixa sahlbergi*, *Callicorixa praeusta*, *Notonecta glauca*, *N. obliqua*, *N. viridis*, *Mesovelia furcata* Mulsant and Rey, *Ranatra linearis* (L.), *Nepa cinerea*, *Ilyocoris cimicoides*, *Gerris lacustris*, *G. odontogaster*, *G. thoracicus* Schummel. **Vertebrates:** *Triturus vulgaris*, *T. helveticus* (Razoumowski), *Rana temporaria* L., *Bufo bufo* (L.), *Esox lucius* L., *Gasterosteus aculeatus*, *Cyprinus carpio*, *Perca fluviatilis* L., *Rutilus rutilus* (L.), *Gobio gobio* (L.), *Rhodeus amarus* Pallas.

#### Flora:

*Lemna minor* L., *L. trisulca* L., *Ceratophyllum* sp., *Miryopyllum* sp., *Elodea canadensis* Micheaux, *Potamogeton natans* L., *Apium nodiflorum* (L.), *A. inundatum*, *Juncus effusus* L., *Callitricha* sp., *Ranunculus fluitans* Lamark, *Carex* sp., *Glyceria* sp.

**Habitat No. 3.** A small circular pond about a hundred yards from No. 2; Nat. Grid Ref. No. 51/248-975. The depth around the margins was variable, in one sector from two to three inches, but generally nine inches to a foot, shelving to about three feet in the centre. On one side of the pond the bottom was covered in dead elm leaves, otherwise the bottom was bare coarse gravel. The pH was usually about 7.

#### Fauna:

**Coleoptera:** *Dytiscus marginalis*, *Noterus capricornis*, *Haliplus ruficollis* (De Geer). **Ephemeroptera:** *Clöen* sp. **Odonata:** *Sympetrum flaveolum* (L.),\* *Zygopterid* nymphs. **Hemiptera:** *Corixa punctata*, *Sigara dorsalis*, *S. falleni*, *S. distincta*, *S. limitata*, *S. scotti*, *Hesperocorixa linnei*, *H. sahlbergi*, *Callicorixa praeusta*, *Notonecta glauca*, *N. viridis*, *N. obliqua*, *N. maculata* Fabr., *Ilyocoris cimicoides*, *Gerris lacustris*, *G. odontogaster*, *G. gibbifera* Schummel. **Mollusca:** *Pisidium* sp. **Vertebrates:** *Gasterosteus aculeatus*.

#### Flora:

*Elodea canadensis*, *Juncus effusus*, *Lemna minor*, *Agrostis* sp., *Glyceria declinata*, *Ranunculus fluitans*.

**Habitat No. 4.** A small circular pond on Hadley Common; Nat. Grid Ref. No. 51/252-973. The depth was very variable, dependent upon rainfall to a far greater extent than any of the other ponds examined. When full, the depth around the margins was about one foot, the depth in the centre was about two feet. This was normally a closed habitat, but after heavy rain water was often observed

\* An immigrant, no positive proof has been discovered of breeding in Britain.

flowing out down the slope to Hadley Wood on the eastern side. The bottom was covered with silty detritus, branches and dead leaves from a nearby oak. The pH was usually about 7.

#### Fauna:

**Coleoptera:** *Dytiscus marginalis*, *Haliphus fulvus* (Fabr.), *H. flavi-collis* Sturm, *H. laminatus*, *H. immaculatus*, *H. ruficollis*, *H. lineati-collis*, *Hyphydrus ovatus*, *Pelobius hermanni*, *Laccophilus minutus* (L.), *L. hyalinus* (De Geer), *Noterus capricornis*, *Coelambus confluens* (Fabr.). **Ephemeroptera:** *Clöen* sp. **Odonata:** *Aeshna* sp. *Anax imperator*, *Libellula depressa*, *Sympetrum* s. *striolatum* (Charp.), *Ischnura elegans*, *Enallagma cyathigerum* (Charp.), *Coenagrion* sp. **Trichoptera:** *Phryganea* sp., *Glyphotaelius pellucidus* (Retz.), *Limnephilus* sp. **Hemiptera:** *Corixa punctata*, *C. dentipes*, (Thomson), *Sigara dor-salis*, *S. falleni*, *S. distincta*, *S. lateralis*, *S. limitata*, *S. fossarum*, *Hesperocorixa moesta*, *H. linnei*, *Callicorixa praeusta*, *Cymatia bors-dorffi*, *Notonecta glauca*, *N. viridis*, *N. obliqua*, *Plea leachi* Mac-  
Gregor, *Ilyocoris cimicoides*, *Nepa cinerea*, *Microvelia reticulata* (Burm.), *Gerris lacustris*, *G. odontogaster*, *G. gibbifera*. **Crustacea:** *Asellus aquaticus* (L.) **Mollusca:** *Planorbis corneum* (L.), *Sphaerium corneum* (L.). **Vertebrates:** *Gasterosteus aculeatus*, *Cyprinus carpio*, *Triturus vulgaris*, *T. helveticus*, *T. cristatus* (Laurenti).

#### Flora:

*Juncus effusus*, *Lemna minor*, *L. trisulca*, *Elodea canadensis*, *Carex* sp., *Alisma plantago-aquatica*, *Sparganium ramosum* Hudson, *Cerato-phyllum* sp., *Glyceria* sp.

Habitat No. 5. Beech Hill Lake (known locally as 'Jack's Lake'); Nat. Grid. Ref. No. 51/272-973.5. The parts worked consisted of the whole of the northern end and the two channels leading to the main body of the lake. This section (northern) was very sheltered by marginal vegetation, hawthorn, alder, willow, etc.; this lake was joined to another by a small water-fall at the northern end. The depth was variable in the area in front of the water-fall, usually about one foot, along the main channel running into the lake, which was worked far more extensively than a small secondary one; the depth was between four and six feet. Where the current was strong in front of the water-fall there was no vegetation and the bottom was pure clay; where the current was less appreciable much rubbish and detritus was present and thick marginal aquatic vegetation was present. The pH was 7.

#### Fauna:

**Coleoptera:** *Ilybius fuliginosus* (Fabr.), *Colymbetes fuscus*, *Haliphus ruficollis*, *Hyphydrus ovatus*. **Odonata:** *Anax imperator*, *Aeshna* sp., *Libellula depressa*, *Ischnura elegans*, *Enallagma cyathigerum*, *Coena-*

grion sp. **Ephemeroptera:** Baëtis sp. **Hemiptera:** Sigara dorsalis, S. falleni, S. fossarum, Hesperocorixa moesta, H. linnei H. sahlbergi, Callicorixa praeusta, Micronecta scholtzi Scholtz, Hydrometra stagnorum (L.), Gerris lacustris, G. odontogaster, G. thoracicus. **Crustacea:** Asellus aquaticus, Gammarus pulex (L.). **Mollusca:** Planorbis sp., Sphaerium sp. **Vertebrates:** Cyprinus carpio, Gasterosteus aculeatus, Rutilus rutilus.

#### Flora:

*Juncus effusus*, *Typha latifolia* L., *Lemna minor*, *L. trisulca*, *Carex* several sp., *ceratophyllum* sp., *Elodea canadensis*, *Mentha aquatica* L., *Alisma plantago-aquatica*, *Callitricha* sp., *Iris pseudocorus* L.

**Habitat No. 6.** An overgrown ornamental pond in Dyrham Park; Nat. Grid Ref. No. 51/225-984.5. The depth at the margins varied between eighteen and twenty-eight inches, and in the centre it was about three feet. The bottom was gravelly, with patches of detritus and rubbish. The western end of the pond was overhung with oak and elm trees, the central part of the lake was overgrown with *Typha* and other emergent plants, and the eastern section was without any apparent vegetation. The pH in the eastern section was 7, in the western section it was about 6.5.

#### Fauna:

**Coleoptera:** *Dytiscus marginalis*, *Hydaticus seminiger* (De Geer), *Hyphydrus ovatus*. **Odonata:** *Aeshna* sp., *Cordulia aenea* (L.), *Libellula depressa*, *Pyrrhosoma nymphula*, *Ischnura elegans*, *Enallagma cyathigerum*, *Coenagrion* sp. **Ephemeroptera:** Unidentified nymphs. **Hemiptera:** *Corixa punctata*, *Sigara dorsalis*, *S. distincta*, *S. falleni*, *S. fossarum*, *Hesperocorixa linnei*, *H. sahlbergi*, *H. moesta*, *Callicorixa praeusta*, *Ilyocoris cimicoides*, *Notonecta glauca*, *N. viridis*, *Microvelia reticulata*, *Gerris lacustris*, *G. odontogaster*. **Crustacea:** *Asellus aquaticus*. **Vertebrates:** *Gasterosteus aculeatus*.

#### Flora:

*Typha latifolia*, *Potamogeton natans*, *Carex pseudocyperus* L., *Iris pseudocorus*, *Polygonum amphibium* L., *Juncus effusus*, *Nuphar lutea* L., *Nymphaea alba* L., *Lemna* sp., *Elodea canadensis*.

**Habitat No. 7.** Large pond in Dyrham Park, near hab. No. 6; Nat. Grid Ref. No. 51/223.5-985.75. The depth at the margins was a few inches, in the centre unknown. The bottom was covered with detritus, twigs and small branches from trees overhanging the western edge. One small section on the eastern side was open to cattle, and here the bottom was covered with a fine silt. There was a small island in the southern end of the pond, with several Scots pines and silver birches growing on it. The pH was 7.

**Fauna:**

**Coleoptera:** *Dystiscus marginalis*, *Hyphydrus ovatus*, *Noterus capricornis*, *Hydroporus palustris* (L.), *Coelambus inaequalis* (Fabr.). **Odonata:** *Aeshna cyanea*, *Anax imperator*, *Libellula depressa*, *Sympetrum striolatum*, *Pyrrhosoma nymphula*, *Ischnura elegans*, *Enallagma cyathigerum*, *Coenagrion puella*. **Ephemeroptera:** *Clöen* sp. **Hemiptera:** *Corixa punctata*, *Sigara dorsalis*, *S. lateralis*, *Hesperocorixa linnei*, *H. sahlbergi*, *Callicorixa praeusta*, *Cymatia coleoptrata*, *Notonecta glauca*, *N. viridis*, *Ilyocoris cimicoides*, *Microvelia reticulata*. **Crustacea:** *Gammarus pulex*, *Asellus aquaticus*. **Vertebrates:** *Cyprinus carpio*, *Gasterosteus aculeatus*, *Rana temporaria*, *Anguis fragilis*, *Natrix natrix*, *Galinula chloropus*, *Fulica atra*, *Anas platyrhynchos*.

**Flora:**

*Juncus effusus*, *Alisma plantago-aquatica*, *Holus lineatus* L., *Lysimachia nummularia* L., *Carex pseudocyperus*, *Iris pseudocorus*, *Nymphoides peltatum*, *Omelia*, *Ranunculus* sp., *Potamogeton natans*, *Ceratophyllum* sp., *Typha latifolia*.

*Habitat No. 8.* A small circular pond close to hab. No. 7; Nat. Grid ref. No. 51/222-986. The depth around the margins was only an inch or two, in the centre about three feet. The bottom was covered with dead leaves from the willow trees which surrounded the habitat. This pond had a pH of between 4.5-6.

**Flora:**

**Coleoptera:** *Dytiscus marginalis*, (larvae) *Acilius sulcatus*, *Agabus bipustulatus*, *Hydaticus seminiger*, *Helophorus aquaticus*. **Hemiptera:** *Corixa punctata*, *Sigara nigrolineata*, *Hesperocorixa sahlbergi*, *Notonecta glauca*, *Gerris lacustris*.

**Flora:**

*Juncus effusus*.

**Middlesex**

*Habitat No. 9.* Mimms Wash Stream; Nat. Grid Ref. No. 51/231-200. This habitat was about six feet wide, the depth varied depending on rainfall. During the winter-spring period it was between two and three feet in the centre and about a foot along the margins. However, during the drier periods of the year the level used to drop to about a foot in the centre and a few inches along the margins. The bottom was clay, with a covering of stones of various sizes. Much detritus and plant remains were found along the edges. This stream divided naturally into two sections, the dividing line was a humped back road bridge. The water was clearer and deeper in the southern section than in the northern. *Potamogeton natans* and *crispus* were

only found in the southern section. *P. crispus* only grew in depressions which had been scoured out of the bottom by the current in the centre of the stream. The northern section was much shallower and faster and the stones on the bottom much larger. Whereas in the southern part vegetation was present in the stream, in the northern it was wholly confined to the banks.

*Fauna:*

**Coleoptera:** *Dytiscus marginalis*, *Ilybius fuliginosus*, *Colymbetes fuscus*, *Helophorus aquaticus* *Agabus didymus* (Olivier), *Derонectes depressus* (Fabr.), *Haliplus* sp., *Gyrinus natator* (L.)?, *Helophorus aquaticus* (L.). **Trichoptera:** *Phryganea* sp., *Glyphotaelius pellucidus* *Limnephilus* sp. **Ephemeroptera:** *Baëtis* sp. **Odonata:** *Libellula depressa*, *Sympetrum* sp., *Pyrrhosoma nymphula*, *Ischnura elegans*, *Enallagma cyathigerum*, *Coenagrion puella*. **Megaloptera:** *Sialis lutaria* (L.). **Plecoptera:** *Amphinemura cinerea* (Olivier). **Hemiptera:** *Corixa punctata*, *C. dentipes*, *Sigara dorsalis*, *S. lateralis*, *S. falleni*, *S. distincta*, *S. limitata*, *S. nigrolineata*, *Hesperocorixa sahlbergi*, *H. linnei*, *Callicorixa praeusta*, *C. concinna*, *Notonecta glauca*, *N. viridis*, *Gerris lacustris*, *G. odontogaster*, *G. thoracicus*, *Velia caprai*, *Hydrometra stagnorum*, *Ilyocoris cimicoides*, *Nepa cinerea*. **Crustacea:** *Asellus aquaticus*, *Gammarus pulex*. **Mollusca:** *Sphaerium* sp., *Limnea* sp., *Plaorbis* sp. **Vertebrates:** *Arvicola terrestris amphibius* (L.), *Gasterosteus aculeatus*, *Gallinula chloropus*.

*Flora:*

*Potamogeton natans*, *P. crispus* L., *Phalaris arundinacea* L., *Carex riparia* Curtis, *C. rostrata* Stokes, *Phragmites communis* Trinius, *Juncus effusus*, *Elodea canadensis*, *Sparganium ramosum*, *Alisma plantago-aquatica*, *Rumex hydrophathrum* Hudson, *Glyceria* sp.

*Habitat No. 10.* A large cattle pond in Wrotham Park; Nat. Grid Ref. No. 51/251.5-995. The bottom of this pond was gravelly like that of No. 1. There was a thick layer of silty detritus and plant remains (*Juncus*), dead leaves from several oaks and elms growing nearby were found in some of the marginal areas. The depth around the margins was a few inches, in the centre about three feet. The pH was usually about 7.

*Fauna:*

**Coleoptera:** *Dytiscus marginalis*, *Pelobius hermanni*, *Hyphydrus ovatus*, *Haliplus fulvus*. **Odonata:** *Aeshna cyanea*, *Libellula depressa*, *Coenagrion* sp. **Hemiptera:** *Corixa punctata*, *Sigara dorsalis*, *S. limitata*, *S. lateralis*, *S. falleni*, *S. distincta*, *S. fossarum*, *Hesperocorixa moesta*, *H. linnei*, *H. sahlbergi*, *Callicorixa praeusta*, *C. concinna*, *Sigara nigro lineata*, *Notonecta glauca*, *N. viridis*, *N. obliqua*, *Plea leachi*, *Ranatra linearis*, *Mesovelia furcata*, *Microvelia reticulata*,

*Gerris odontogaster*, *Ilyocoris cimicoides*. Crustacea: *Asellus aquaticus*. Vertebrates: *Triturus vulgaris*, *Cyprinus carpio*, *Gasterosteus aculeatus*, *Fulica atra*, *Anas platyrhynchos*, *Gallinula chloropus*.

Flora:

*Potamogeton natans*, *Ranunculus fluitans*, *Juncus effusus*, *Carex* sp., *Glyceria fluitans*, *Lemna* sp., *Alisma plantago-aquatica*, *Ceratophyllum* sp.

(To be continued.)

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## BOOK REVIEWS

*The Butterflies of the Malay Peninsula*, by A. Steven Corbet and H. M. Pendlebury. Second Edition revised by A. Steven Corbet and edited by N. D. Riley. pp. xi, 537. 55 plates (8 coloured). 159 text figs. Edinburgh and London, Oliver and Boyd, 1956. Cloth. Price £5 5s.

The first edition of this book, published in 1934 in Kuala Lumpur, has long been out of print and in such brisk demand that the considerable public now awaiting the publication of this second edition will be anxious to know the extent of the revision and enlargement. When Steven Corbet died suddenly in May, 1948, this second edition was just on going to press, and the whole of the revision was therefore a product of his very capable hands. It is just as thorough as one would expect any work from his pen to be and will for ever be a monument to his industry. The delicate job of seeing another man's work through the press and editing it through the difficult period of proofing was undertaken by N. D. Riley, who is to be congratulated on the final outcome.

The enlargement, too, is striking; the text of this edition is double that of the first. There were 2 coloured and 14 plain plates in the first edition and 8 coloured and 47 plain plates in this.

The publishers claim that 'Naturalists should be able now, with the aid of this volume alone, to identify any butterfly met with in Malaya'. This claim is undoubtedly justified, and the book will be a great boon to many entomologists both inside and outside Malaya.

The price, for a work of this size, is reasonable and will be within the reach of many pockets which could not afford the less comprehensive and very scarce volumes of *Rhopalocera Malayana*, by W. L. Distant, and the *Into-Australian Rhopalocera* volumes of Seitz *Macrolepidoptera of the World*. The latter, of course, covers a much wider area, but the demand for a compact and complete work on the Butterflies of Malaya is considerable and we hope will be gratifying to the publishers, who have undertaken the production in an adequate manner.

E.W.C.

*Mosquitoes: Their Bionomics and Relation to Disease*, by William R. Horsfall. New York: London. Constable. 1955. pp. viii, 723. Cloth. Price £5 5s.

The author of this book starts his preface by explaining 'The objective of this book is to summarize, as completely as possible, the large and varied literature on mosquitoes that pertains to their bionomics and relation to disease'.

At the present time, when accumulated knowledge has become so extensive and at the same time so scattered, the man who is prepared to undertake (and capable of undertaking) a work of compilation and collation such as this is doing a very great service to all present and future workers in the field.

The book is arranged systematically and the references are admirably easy of access.

Modern control methods and their application to the individual species are included and this will make the book valuable to a very wide public, which may not have been moved to purchase a less eminently practical book at the price.

The bibliography (of 79 pages) contains well over 4,000 references.

There can be little question that, as a reference book, this will take a permanent place in the library of every living worker on the Culicidae. It will save thousands of man-hours and often render it unnecessary to consult references prior to about 1953. This in itself is a great recommendation, and we hope that sales will be such that it will quickly have to be reprinted in a larger edition, which might enable the publishers to make a considerable reduction in the price.

E.W.C.

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## NOTES AND OBSERVATIONS

### *CRYPHIA DIVISA* ESP., (*RAPTRICULA* HUBN.) IN HAMPSHIRE (LEP: CARADRINIDAE)

A slightly worn specimen of *Cryphia divisa* (The Marbled Grey) came to my mercury vapour trap on the night of 18th August, 1955. I feel that it might be of interest to add that, unlike Mr. Haggett's specimen (*Ent. Gaz.* 1954, 5: Pl. 5), mine had its wings folded in the normal noctuid fashion, not tightly rolled round its body in the typical Footman way as his was.

JOHN R. LANGMAID.

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## CECIDOMYIDAE (DIPT.) FROM NORFOLK—II

By S. A. MANNING, F.L.S., F.R.E.S.

It is first necessary to make two corrections and a number of additions to my previous paper (Manning, 1955). The additions are the result of further determinations made by Mr. R. D. Eady, Commonwealth Institute of Entomology, and Mr. M. W. Graham, University Museum, Oxford, to whom I extend my grateful thanks.

*Wachtiella persicariae* (L.). On p. 211 parasites which emerged from galls of this midge were referred to as *Torymus persicariae* Mayr. Mr. R. D. Eady informs me that this name cannot be used, as he can find no record of its publication; but he suggests that *T. polygoni* Mayr (1874 in test, according to Hoffmeyer, 1930) would be correct.

*Putoniella marsupialis* (F. Loew). On p. 213, lines 4 and 5 of the paragraph concerning this midge should be transposed.

*Rhabdophaga rosaria* (H. Loew). p 205. An example of *Eurytoma* sp. emerged from what was probably an old rosette gall of this midge collected at Old Buckenham, 8th February, 1950.

*Rhabdophaga* sp. p. 206. During July/August, 1951, examples of *Gastrancistrus* sp. emerged from the galls collected at Old Buckenham, 29th June, 1951. Individuals of *Torymus tipulariarum* Zett. emerged from the galls taken at Sutton Broad, September, 1952.

*Dasyneura epilobii* (F. Loew). pp. 206-7. The insects which emerged between 7th and 23rd August, 1951, from galls of this midge collected at Old Buckenham, 20th July, 1951, have been identified by Mr. Graham as *Systasis encyrtoides* Wlk.

*Wachtiella persicariae* (L.). pp. 210-211. Galls of this midge from Drayton, 25th August, 1950, had yielded examples of *Tetrastichinae* sp. by 4th September, 1950.

The following records refer to material collected in the Earlham Park area of Norwich during the Summer of 1955.

*Dasyneura acrophila* (Winn.). Galls containing the gregarious white larvae were found on Ash (*Fraxinus excelsior* L.), 6th June.

*D. engstfeldi* (Ruebs.). On 21st June plants of Meadow-sweet (*Filipendula ulmaria* (L.) Maxim.) bore galls which Dr. H. F. Barnes, Rothamsted Experimental Station, thinks may be those of this midge. The gall contained a solitary whitish larva and consisted of a swelling on the undersurface of a leaf-vein which opened in a narrow slit on the upper surface of the leaf.

*D. fraxini* (Kieffer). On 25th June galls on Ash (*Fraxinus excelsior* L.) contained the small, gregarious orange larvae.

*D. pustulans* (Ruebs.). On 21st June some gall-pustules on Meadow-sweet (*Filipendula ulmaria* (L.) Maxim.) were empty, while others contained solitary larvae.

*D. trifolii* (F. Loew). Galls on *Trifolium* sp. contained gregarious pale orange larvae on 21st June.

*Jaapiella veronicae* (Vallot). Galls were first noticed on Germaner Speedwell (*Veronica chamaedrys* L.) on June 13th.

*Janetiella leméi* (Kieffer). Galls containing larvae were present on *Ulmus glabra* Huds., 25th June.

*Physemocecis hartigi* (Liebel). Gall-pustules similar to those described for this midge were found on leaves of *Tilia platyphylla* Scop. on 16th June. Several galls were opened but there was no sign of larvae.

*Rondaniola bursaria* (Bremi-Wolf). Galls were first noticed on leaves of Ground Ivy (*Glechoma hederacea* L.) on 7th July.

*Contarinia tiliarum* (Kieffer). Galls on *Tilia platyphylla* Scop., 16th June.

*Macrodiplosis dryobia* (F. Loew). Galls containing white larvae on leaves of *Quercus robur* L., 14th June.

#### REFERENCE

**MANNING, S. A.**, 1955. Cecidomyidae (Dipt.) from Norfolk—I. *Ent. Gaz.* 6:205-214.

249 *The Avenues, Norwich.*

23rd December, 1955.

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#### RECENT LITERATURE

In *Annales Entomologici Fennici*, Vol. 21, No. 4, 1955 (pp. 165-170), is the description of a new species of Diptera (Agromyzidae), from Great Britain, by Esko Kangas.

The new species is *Dendromyza cerasiferae* Kangas. The Type locality is East Malling, Kent, and the larvae live on species of *Prunus*.

In *Trans. R. ent. Soc. Lond.*, Vol. 107, 1955 (Karl Jordan 94th Birthday volume), are many fine papers. Perhaps those most interesting to readers of *Ent. Gaz.* are those by Dr. Bryan P. Beirne, F. G. Smit and M. Rothschild, and N. D. Riley. Dr. Beirne's paper is entitled *Zoogeographical significance of distributional changes in British Macrolepidoptera*. Smit and Rothschild describe two new subspecies of fleas from the British Isles and discuss their distribution. Mr. Riley entitles his contribution *Karl Jordan and the International Congresses of Entomology*. As Dr. Jordan is the 'father' of the Congresses, this essay is in effect a short history of the foundation and progress of the International Congresses.

## SUGGESTED METHOD OF RECORDING THE OCCURRENCE AND DISTRIBUTION OF INSECTS

By CAPT. W. S. WRIGHT, B.Sc., F.R.E.S.

In describing the frequency of occurrence of a particular species in a book or local list it is often difficult to gauge the exact degree of emphasis which the author intended (by such terms as common or scarce) so I suggest the following as a more exact method.

In describing the distribution of plants, or animals, there are two factors to be considered:

1. The numbers found under normal conditions.
2. The area under consideration.

In order that a description is complete, and as exact as possible, these two must be taken separately.

### *Numbers.*

It is usual to find such terms as Common, Frequent, Scarce, and Rare, there being no indication or correlation between different authors. I suggest that a series of numbers, from 1 to 10, would be a much better method of indicating the population of a species in the area under review.

If the figure 10 be taken to indicate the occurrence of a very common species, and the figure 1 to indicate the occurrence of a very rare species which is only found as single specimens, the figures from 2 to 9 would be used to indicate the grading between, giving an evenly graded sequence.

1. Very rare, only found as single specimens each season, or even less frequently.
2. Very rare, one or two each season.
3. Rare, a few specimens each season.
4. Slightly more than three usually found each year.
5. More frequent than 4.
6. Usually got during normal collecting.
7. More frequent than 6.
8. Common.
9. Very common.
10. Very common, and found in large numbers.

### *The Area.*

This must be definitely stated, that is—is it a county, country, or island which is under consideration. The description is either widespread or local. If widespread it occurs throughout the area, if local, the species is restricted in area to certain localities, and is either due to obvious reasons, such as distribution of food plant, or in certain cases, for some reason unknown, the species is only found in restricted localities. It is suggested that W indicates widespread and L local.

*Migration.*

Species known to be migrants must be considered separately. In some cases the local population is supplemented by migration. It is usual to think of migrants as coming from a distance, but in some cases this migration may be quite local.

When considering migration, the following factors are important:

- a. Numbers present at source.
- b. Distance from source.
- c. Weather conditions, especially prevailing wind.
- d. Flight power of the insect.

I suggest that migrants should be indicated by the letter M, followed by appropriate number indicating occurrence.

*Conclusion.*

Following from the above, a very common and widespread species would be indicated by W.10, a species which is very rare, but found throughout the locality under consideration, would be W.1. A local species which is common where found, would be L.10, with, if known, the reason why the species is local, such as food plant restriction, sea coast, bog, etc. Migrants would be M, with the number indicating occurrence, and if it is known that the species breeds locally, its distribution could be indicated such as W.6 plus M.4.

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#### NOTICE

We have been requested to announce that Señor I. M. Palau Camps, Sociedad de Historia Natural de Baleares, Estudio General Luliano, C San Rogue n.<sup>o</sup>8, Palma, de Mallorca, Spain, wishes to correspond with entomologists in Great Britain who are interested in the Curculionidae (Coleoptera).

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